On the Scope of Digital Vocabulary Trainers for Learning in Distance Education

Thesis

On the Scope of Digital Vocabulary Trainers for Learning in Distance Education

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Abstract

This study explores the use of digital vocabulary trainers (DVTs) for L1 (first/native language) - L2 (second/foreign language) paired associate vocabulary learning in the context of distance learning and where students are mature adult learners.

The literature review approaches the topic from three different angles: firstly, what is involved in vocabulary learning in terms of memory processes, learning strategies and motivation to learn. Secondly, it was investigated how computer-assisted language learning (CALL) and in particular, use of DVTs, can support the learning of vocabulary and lastly, the role the specific learning context of distance education plays where vocabulary learning is concerned.

To set the context, the study outlines the capabilities of different DVTs and how these are linked to theoretical frameworks, how distance learners engage with DVTs, to what extent vocabulary learning with and without DVTs differs and what students' preferences for particular features of DVTs are.

The research is based on a quasi-experimental study to explore the scope and limitations of DVTs used by adult distance learners at the Open University in the UK. A mix of methods was utilised, generating both quantitative and qualitative data. After participating in a trial use of DVT for beginners' German, Open University language learners participated in a number of surveys investigating the way in which they engage with DVTs, whether there is any indication that the use of these tools improves performance and how students perceive DVTs as learning tools.

Additional surveys investigated the general attitude of distance language students to DVTs, and focus groups were formed from students using DVTs for study. Data

from these focus groups show that mechanisms typically employed in game playing (e.g. points, badges, leader boards) can have a positive effect on motivation for learning. It is therefore concluded that a review of current pedagogy may be useful and that new approaches to more integrated vocabulary training could have positive effects on language learners.

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Introduction

In my practice as a German teacher and lecturer in secondary, tertiary, higher and adult education I have often been asked by students for recommendations on how to learn vocabulary and have also seen a plethora of strategies that students use for learning vocabulary.

When students speak of 'learning vocabulary', it is obvious what they mean and want to achieve: to be able to apply the foreign word correctly in the appropriate context with sufficient speed to ensure fluency. Depending on whether the word is needed in writing or speaking, there is also the need for correct orthography and pronunciation. In addition there is the question of how to know which words to learn, how to establish their meaning and how to record this information. Then, there is the issue of how to ensure that what has been learned, can also be retrieved in the long-term. Therefore, the answer to the question of how to learn vocabulary is a complex one and it involves more than just quick study advice. It is also dependent on many other factors, such as learning preferences and styles, motivation, reason for learning and many others.

Language teaching has undergone a range of changes during the time that I have been teaching and learning languages: as a teacher and student I have experienced both grammar-translation and audio-lingual teaching, heavily focusing on grammar and direct vocabulary teaching through decontextualised drills and paired associate learning in form of word lists.

At the start of the 90s in the UK, communicative language teaching (CLT) was favoured in the foreign language classroom. Richards (2006) characterised CLT methodology as a 'whole-to-part' approach, rather than the 'part-to-whole' methodology practised in earlier language teaching. Although CLT contained a

degree of mechanical practice in the form of 'pre-communicative activities' such as drill-based 'structural activities' (Littlewood, 1981), focusing on grammar and vocabulary, the majority of material was centred around exposing students to authentic texts and training learners to cope with different genres of text and a variety of tasks. The shift in focus meant that textbooks presented fewer opportunities for such mechanical tasks and vocabulary learning was largely indirect and incidental.

Many students found the more communicative-oriented textbooks lacking in structural activities and looked for alternative ways of learning vocabulary. Their need for more guidance on how to learn and my interest in finding both theoretical and practical solutions started my research interest into the psychology of learning with particular reference to language and vocabulary learning.

In 1991 the 16th edition of Sebastian Leitner's book '*So lernt man lernen*' (How to learn to learn) was published, after it had appeared for the first time in 1972. Leitner's book is a guide on how to learn effectively, so that what has been learned is secured firmly in memory and can easily be retrieved at a later stage. Leitner distinguishes between '*gehäuftes Lernen*' (massed learning) and '*verteiltes Lernen'* (distributed learning). Referring to behaviourist psychology and studies by Thorndike (1931), Ebbinghaus (1885), Jost (1897) and Meumann (1908), he concluded that learning is best when it is distributed over time thus providing ample opportunities for revision. He introduced the '*Lernkartei*', a physical learning system consisting of a box with four compartments, which increase in size, and notecards. These would be used for recording facts, e.g. vocabulary, questions and answers etc. New items would be placed in the first box and would progress through to the last compartment but those items less easily recalled would stay in or be returned to

the first compartment. However, one of the drawbacks was the design of the system: while effective, the box was cumbersome to use. Using the cards on their own allowed students to take their cards with them and learn wherever they were but still being able to change the order of items (unlike in word lists). During the start of the rise of digital technology use in the mid-80s, Piotr Wozniak (1990, 1995) carried out extensive research into memory and forgetting. Applying an entirely behaviourist, stimulus-response approach, he developed a computer method that would help memorising vocabulary and reduce the rate of forgetting by scheduling personalised training sessions. By running on a specifically developed algorithm, the so-called 'spaced repetition' schedule (SRS), Wozniak had changed Leitner's card system into a powerful digital learning aid by 1987, consisting of a downloadable software programme which could be purchased and run on a home computer. With fewer people using personal computers in the late 80s and 90s for leisure or lifelong learning, there had only been very few learners who had been familiar with digitalised vocabulary learning programmes and of those most were computer-literate, using computers routinely.

In 1997 The Open University (OU) offered the first German course. As an Associate Lecturer (AL) my teaching environment had changed to distance learning but the majority of learners were mature, adult students. Face-to-face tutorials were less frequent than one would expect in traditional university settings. What had not changed was students' anxiety about vocabulary learning. Finding, translating, recording, memorising and maintaining vocabulary was to a large degree a skill students had to develop themselves. Many learners found – and still do – that juggling the fast pace of the courses with family, work and other commitments can be difficult. When learning is the sole occupation in a young pupil's life, it is relatively

easy to learn large amounts of vocabulary. When exposure to language in face-to-face settings is more limited, new and different learning strategies are needed to create learning opportunities to keep students keen and motivated. With the introduction of blended learning – in the case of the OU blended learning stands for the combination of online and face-to-face tuition (Rooney, 2003; Young, 2002) – and an increase in digitalised learning content and in internet use for leisure and learning across a multitude of platforms, flashcard learning websites became prominent and popular supplementary learning aids. These learning tools offer help in an area which students have traditionally found difficult to tackle. In 2006, two major spaced-repetition programs, Anki and Mnemosyne, adopted a similar algorithm to the one that had been implemented in SuperMemo but could be downloaded for free. In 2007, Quizlet was launched which offered a non SRS-system of flashcards, which could be used online, without a download or account.

It appeared that both spaced-repetition systems (SRS) and non-SRS flashcard programmes – or, more generally: digital vocabulary trainers (DVTs) - were ideal for learning vocabulary in a new way. The fact that many programmes are multi-modal, offer a range of activities beyond simply linking one word to its translation equivalent and the ease with which some of these DVTs can be used away from home and books seemed appealing. As learning content is increasingly reduced to fit into short periods of intensive study during lunch breaks or any other 'downtime', often referred to as 'chunk', 'bite-sized' or 'micro learning', the availability of these programmes on mobile platforms is ideal.

On the one hand, my interest as a practitioner in DVTs as a learning tool for students stemmed from identifying a need for more effective learning techniques or strategies for vocabulary learning. On the other hand, as a researcher I wanted to understand what the theoretical foundations of DVTs were and how these linked in

with learning theory and in particular theories of vocabulary learning. I was also interested to find out whether DVTs could make a difference in performance and how and why learners used these relatively new tools in their learning.

The following questions were formulated at the start of my research and addressed the areas of vocabulary learning with DVTs which I was most interested in. These questions were later refined to some degree to form my research questions.

- How does vocabulary learning with DVTs in a distance learning context with mature students affect learning and retaining vocabulary learning?
- How do learners perceive having access to translated, preloaded, course-specific vocabulary?
- How do mature, distance learning students use DVTs?
- How and to what extent do DVTs have an influence on motivation?

The aim of this research was simple: by surveying mature students from a 'non-traditional', distance learning university, data could be used to attempt to draw conclusions for theory and practice about approaches to effective vocabulary learning with DVTs in a blended learning context.

Various methods for data collection were designed to allow insights into how adult learners engaged with DVTs and whether the use of DVTs had any influence on performance in vocabulary tests and on motivation. Students would be given access to translated vocabulary on a DVT and would be tested on vocabulary at three stages in their studies. Each test would also survey participants' engagement with the tool. After a preliminary analysis of the data, two further qualitative data collection opportunities would be created (in form of interviews and focus groups) to delve deeper into some of the issues that emerged from the first stage of study.

These methods and questions provided the framework for my research which I will report on in the ensuing research thesis.

First, a literature review will offer an overview of some of the key themes related to vocabulary learning and DVTs. This is followed by a description of the study itself and the discussion of the findings. Lastly, the relevance and limitations of the research will be evaluated and implications for theory and practice will be considered.

Part 1 Literature review

Introduction to Part 1

There has been extensive research into foreign vocabulary learning and the question of how students can successfully learn large volumes of vocabulary which has resulted in increased interest in this area (Schmitt, 1997)**.** Folse (2004b) emphasises the importance of knowing vocabulary over grammar and recognises vocabulary as the most important building block for successful communication. Students have grappled with the challenges of vocabulary learning in the past and developed a wide range of learning strategies to help with this aspect of language learning. These strategies however also depend on the age of the learner and the learning environment. Adult learners who are studying a foreign language in a distance learning context, will experience vocabulary teaching and learning in a different way than their younger counterparts. Robinson (2003) found that adult language learners displayed greater cognitive and linguistic abilities than younger learners. Adult learners have more capabilities to reflect on their learning; more life experience also translates into more coping strategies and larger memory store. Yet while some conditions are more favourable in adult learners when it comes to learning, there are just as many that work against successful learning – adults will be faced with more demands on their time and distractions when studying and will also be expected to express more complex ideas than children. Language learners, whether they are adults in post-compulsory distance education or young learners in a different learning environment will be motivated by different factors.

The ever-growing presence of digital vocabulary trainers (DVTs) such as flashcards for vocabulary learning offers language learners a new strategy for engaging with

vocabulary. While some of the underlying principles of DVTs differ – some are spaced-repetition systems, others base the degree of knowing on users' self-confidence ratings, while others simply present vocabulary sets - one of the features, which sets them aside from traditional paper-based flashcards or word lists, is that they contain elements of game design or gamification.

As vocabulary is the focus of the present research, it is a good starting point to first of all consider what is involved in knowing a word, before turning to the themes of memory, learning strategies, motivation, computer assisted language learning and digital vocabulary trainers, learning context and game design.

Chapter 1 Knowing a word in another language

Before examining more closely what it means to know a word, it is essential to consider the terms ‘word’ and ‘vocabulary’ in general and in the context of this thesis. Trask (1993) defines a word as a ‘lexical item’, i.e. ‘a single item belonging to some lexical category, having an identifiable meaning or grammatical function and typically a fairly consistent phonological shape, though possibly exhibiting a certain amount of inflectional variation reflecting its environment in particular sentences….’ or, more briefly: A single distinct conceptual unit of language, comprising inflected and variant forms’ (Collins English Dictionary, 2015).

The term ‘vocabulary’ on the other hand refers to ‘all the words contained in a language’ in general terms but when using the term in the context of language teaching and learning, it means ‘a listing, either selective or exhaustive, containing the words and phrases of a language, with meanings or translations into another language…’ (Collins English Dictionary, 2015).

So, what does it mean precisely when we are talking about ‘knowing words’?

Knowing a word means that it is necessary to form a link between the form, meaning and use of a word (Nation, 2001). For the less proficient language learner in the initial stages of their language learning, the main focus will be on establishing the form-meaning link so that vocabulary size can be rapidly increased. Work on word use occurs at a later stage, once students have acquired the basics of grammar, so that collocations and constraints in use can be understood and evaluated, according to Nation (Nation, 2001).

Psycholinguistic studies show that extensive use is made of the first language (L1) during vocabulary learning (Sundermann and Kroll, 2006) which would suggest that harnessing this processing feature to maximise intentional lexical learning is

advantageous. Prince (1996) and Ramachandran and Rahim (2004) report more effective recall of L2 (foreign or second language) words if L1 was used for establishing the form-meaning link.

Nation and Nation (1990) emphasise the importance of the receptive/productive distinction in the study of vocabulary learning. Receptive vocabulary involves encountering the word form in a listening or reading activity, while productive vocabulary involves retrieving the appropriate word in speaking or writing.

Meara (1990) interprets the distinction thus: the active vocabulary can be activated by other words because of the many links it has formed with other words; passive vocabulary can only be retrieved by outside stimuli, i.e. passive vocabulary cannot be reached via other parts of the mental network but will only be recognised if one can hear it or see it. Fundamentally, though, 'knowing' a word means knowing its form, meaning and use. Being able to use a word receptively only requires knowing some distinctive features, while being able to use a word productively means that the knowledge has to be more precise.

Ellis and Beaton (1993) suggest that in the early phase of learning, the new word has only one link to the L1 equivalent (known as the receptive direction). Changing the direction to productive direction L1 → L2 makes the learning or recall more difficult because there are more links to choose from. To illustrate this, Ellis and Beaton (1993) constructed the following example: the German word '*Essen*' can easily be linked to one English translation equivalent 'food'. However, when translating from L2 to L1 (i.e. receptive direction), the lexical entry 'food' has many links to other similar entries, e.g. 'nourishment', 'staple', 'meal' or 'groceries', which de-stablises the original L1-L2 link, due to the strengthening of other neural connection, the link that is created between the two items which allows storage and retrieval, between the L1 item and the target L2 equivalent stored in memory.

Before examining how neural networks are formed to enable effective storage and successful retrieval of lexical items, it must be examined how information is processed in memory.

Chapter 2 Memory and vocabulary learning

Memory can be seen as a multi-store model as proposed by Atkinson and Shiffrin (1968) – also referred to as the 'Atkinson-Shiffrin Model', which describes memory as a three-stage model consisting of sensory, working and long-term memory. According to the model, single items are kept in the working memory for a short time (therefore working memory is referred to as short-term memory by some researchers) before being moved to long-term memory. The model also helps to understand the processes involved when memories are formed:

1. Items are *encoded* and moved from one stage to the next.

2. Memory traces are stabilised and thus *consolidated* .

3. Information is *stored*, i.e. kept in a particular memory (i.e. short- or long-term).

4. Information is *recalled* or *retrieved* from long-term memory, travelling along the memory pathway; in other words, the retrieval process is the reversal of the encoding process. Each retrieval is followed by further storing, thus strengthening the connection more.

However, Craik and Lockhart (1972) propose an alternative model of memory referred to as the 'Levels-of-Processing Model'. In this model the success rate of retrieval of information is dependent on the depth of processing of information to form memory traces.

The Depth of Processing Hypothesis (DOPH) posits that deeper processing and semantic involvement would lead to a more stable memory trace, thus making memorisation and subsequent retention and retrieval more effective. This would

mean, for example, that guessing from context would involve less deep, and therefore less effective processing than looking up the meaning of a word in a dictionary or glossary (Knight, 1994; Luppescu and Day, 1993).

2.1 Depth of Processing Hypothesis

Studies by Cohen and Aphek (1981), Ahmed (1989) and O'Malley *et al.* (1985) found that learners favour simple, more mechanical strategies for learning vocabulary over more complex ones. However, such strategies constitute what Craik and Lockhart (1972) would refer to as 'shallow processing strategies', which are claimed to be less effective than 'deep processing strategies' in helping students to learn.

Schmitt (1997) refers to studies by Cohen and Aphek (1981) and Pressley *et al.* (1982) who all support the DOPH but also argues that there is a place for shallow strategies, too, citing Nation's (1982) extensive review of the literature on vocabulary learning by means of word lists, and concludes that this type of strategy is an effective way of learning a large quantity of lexical items in a short period of time. O'Malley and Chamot (1990) found the same evidence for rote learning.

Hulstijn and Laufer (2001) also investigated levels of engagement or 'involvement' with vocabulary and described three features affecting involvement: 1. need – if the target word is not needed for the completion of the task, the need is minimal, so there is very little involvement; 2. search – if the target word is glossed in the margin and no searching is necessary, involvement will be very low; 3. evaluation – where the learner has to make choices between words, e.g. choosing the correct word from a number of dictionary entries, or write their own composition, involvement is high. Hulstijn and Laufer hypothesised that the greater the involvement load (in

other words, the more complex the processing), the more effective the learning of vocabulary.

Based on evidence from studies into depth of processing (Craik and Lockhart, 1972; Craik and Tulving, 1975; Cohen and Aphek, 1981; Pressley, Levin and Miller, 1982; Pressley, Levin and Delaney, 1982; O'Malley and Chamot, 1990), Schmitt (1997) concludes that shallow vocabulary learning strategies, i.e. strategies which involve very little manipulation or processing of the item to be learned, may be more suitable for beginners, while more complex processing strategies are more appropriate for more advanced learners.

Therefore, in terms of vocabulary learning methods, what are the particular strategies used for this purpose?

Chapter 3 Vocabulary learning strategies

Vocabulary learning is the area in which learners use learning strategies most frequently (Klapper, 2008). Oxford (1990:8) defines learning strategies as 'operations employed by the learner to aid the acquisition, storage, retrieval and use of information'. Therefore vocabulary learning strategies are those actions which are undertaken by the learner to affect the process.

Based on research with her *Strategy Inventory for Language Learners (SILL)*, Oxford (1990) organizes learning strategies into four areas: cognitive, memory, metacognitive and social. Cognitive strategies are used in the process of breaking down new material, processing and transforming it, so that memory strategies help linking new knowledge to existing knowledge. Metacognitive strategies relate to a learner's conscious decisions made in the learning process, while social strategies involve interaction with others to aid learning.

Schmitt (1997) accepts Oxford's taxonomy but sees shortcomings when these strategies are applied to discrete vocabulary learning. It is problematic to clearly differentiate memory strategies from cognitive strategies and the taxonomy does not take sufficiently into account what happens when learners first encounter new words.

3.1 Schmitt's Vocabulary Strategy Learning Taxonomy

As Oxford's taxonomy considers learning strategies needed for language learning in general, Schmitt (1997) developed this taxonomy further, producing an inventory of strategies solely (or at least predominantly) used for vocabulary learning. Four of Schmitt's proposed strategy types were adopted from Oxford's strategy dimensions: social, memory, cognitive and metacognitive, with an additional fifth strategy: determination. This particular strategy would help the individual learner to make

sense of the new word ‘without recourse to another person’s expertise’ (Schmitt, 1997:205). Schmitt added two further dimensions, based on distinctions suggested by Cook and Mayer (1983) and Nation and Nation (1990), which, on the one hand, accounts for initial *discovery* of a new word and, on the other, for remembering the word later (*consolidation*). Nation (2001) developed these taxonomies further by proposing three overarching categories:

> *Planning*, i.e. making decisions about which words to learn, which aspects of the word to focus on and making appropriate selections from a range of vocabulary learning strategies.
>
> *Sources* (equivalent to ‘discovery’ strategy in the earlier model), i.e. gaining information about the word by, for example, analysing word parts, guessing from context or consulting formal sources such as dictionaries or spontaneous sources such as teachers or native speakers.
>
> *Processes* (equivalent to ‘consolidation’), i.e. establishing vocabulary knowledge through first of all noticing the word and recording it, retrieving it and generating the word in an appropriate context.

Taking up Schmitt’s earlier criticism of the difficulty of distinguishing between memory and cognitive strategies, the same applies to the use of these terms and the term ‘meta-cognitive strategies’ in Table 1. There is a degree of overlap among these terms and boundaries between these are not clear-cut. While it is recognised that this division is problematic, it nevertheless focuses the attention on particular processes involved in the strategy.

Schmitt’s and Nation’s taxonomies are synthesised in Table 1.

Table 1 A synthesised taxonomy of vocabulary learning strategies, based on Schmitt (1997) and Nation (2001)

Dimension	Discovery/Sources		Consolidation/Processes		
Determination	Analysing - parts of speech - affixes and roots -any available pictures/gestures	Using - monolingual/bilingual dictionaries - word lists - flashcards Guessing from context Checking for L1 cognates			
Social	Asking someone for - an L1 translation - a paraphrase/synonym of new word - a sentence including new word - meaning Discovering new meaning through group work		Studying and practising meaning in a group Checking of students' flashcards/wordlists for accuracy by teacher Interacting with native speakers		
Memory			Studying - words with a visual representation of its meaning - spelling/sound Learning words of an idiom together Grouping - words together (spatially on a page) - words in a storyline	Imagining word's meaning Associating words with its coordinates Connecting words to synonyms/antonyms Remembering affixes/roots/parts of speech Paraphrasing the word's meaning Saying new words out aloud Imagining word form Underlining initial letter of word	Using - semantics maps/semantic feature grids - scales for gradable adjectives/ - Peg[1]/Loci[2]/Keyword method - new words in sentences - cognates - physical actions when learning
Cognitive			Verbal/written repetition Using - word lists/flashcards/vocabulary sections in textbook Taking notes in class Listening to tapes of word lists Putting English labels on physical objects Keeping a vocabulary notebook		
Meta-Cognitive			Using - L2 media (songs, films, news etc.) - spaced word practice	Testing oneself with word tests Skipping or passing new words Continuing to study words over time	

[1] Method for linking new words to hook words. First, peg words are memorised (e.g. "one is nun", "two is shoe" etc.); then new words are linked to the peg by creating an image – if the first word to be remembered is "cake" then the image should be a nun holding a cake etc.

[2] This method is similar to the peg method but uses a familiar place, e.g. a street, as the hook. The items to be remembered are placed along the place. So in order to recall a particular item, one mentally walks along the location until the item is reached.

In a study by Schmitt (in Schmitt and McCarthy, 1997), in which Japanese learners of English of different age groups were surveyed on their strategy use and perceived usefulness of these strategies, Schmitt found that the strategies used for consolidating meaning, involved saying words out loud or writing them down repeatedly. However, in order to discover the meaning of a word initially, the study showed that 95% of participants used a bilingual dictionary and just under half regarded guessing from textual context as helpful. Therefore, it must be examined to what extent guessing can be a useful strategy to adopt. Two hypotheses need to be explored: do students not guess because there is no need and their learning would not benefit from it, or might there be a benefit but students do not have enough to guess from or simply do not know how to guess effectively?

3.2 Guessing from context

Nation (1990:130) notes that 'guessing from context' is the 'undoubtedly most important vocabulary learning strategy'. While it may be effective for initial meaning establishment, what impact does guessing have on retention and recall?

Kelly (1990) distinguishes between formal guessing, i.e. looking at morphological or morpho-syntactic features of a word, and contextual guessing, i.e. relying purely on context.

While guessing can be a successful strategy, various studies show the disadvantages of merely relying on guessing for vocabulary learning. Huckin and Coady (1999) point to the problems of guessing: it is imprecise, time-consuming and the rest of the context must be understood well, in order for guesses of individual

words to be correct. Sökmen (1997) shares this concern about the potential lack of accuracy and efficiency of the process and cites studies by Pressley, Levin and McDaniel (1987) and Kelly (1990), which indicate that learners are rarely correct in their guesses. Ramachandran and Rahim (2004) also conclude that guessing from context and not having recourse to any L1 translations is not appropriate at beginners' level but would suit more advanced learners.

While guessing may help with comprehension, it does not necessarily aid retention, although it could be argued that the deeper involvement with the item should lead to a stronger memory trace.

Where incidental vocabulary learning is concerned, beginners are disadvantaged because it is not possible for them to guess from context. Around 3000 words, providing coverage of around 95% of a text, are needed before effective guesses at vocabulary meaning in an authentic text can be made (Liu and Nation, 1985). This means that in a typical beginners' course, a large amount of vocabulary has to be learned in a relatively short period of time. Ramachandran and Rahim (2004) advocate the use of L1 and L2 translations in form of word lists in teaching languages at beginners' level.

Furthermore, there has also been a shift in the perceived benefits of incidental vocabulary learning, in favour of more systematic, explicit approaches (Godwin-Jones, 2010). Therefore it seems that there is a place for translated word lists and pre-translated flashcards in the context of beginning a language.

3.3 Word list and word card learning

Word lists refer to handwritten, typed or printed lists with the word in L1 on one side and the translation equivalent in L2 on the opposite side. Word cards are usually index cards which have on one side the L1 word and on the other the translation equivalent.

Many practitioners believe that decontextualised vocabulary learning in the form of word cards is outdated and does not fit within a communicative teaching approach. However, Schmitt and McCarthy (1997) refer to a number of studies that show that word card learning is effective in terms of vocabulary growth over time (Nation, 1982; Paivio and Desrochers, 1981; Pressley, Levin and Delaney, 1982). There is also evidence in general that form-focussed, explicit teaching achieves better results than purely meaning-focussed, implicit teaching and learning (Ellis, 1990; Long, 1988).

Word cards are easy to create and are 'mobile'. A further advantage of word card learning lies in the ease with which words can be grouped and re-grouped. This means that individual words are revisited and repeated, so that the increased attention the items receive helps to strengthen the connection between the L1 and L2 in memory. By approaching learning in this focused manner, sufficient time is spent on each item, without neglecting older material.

Fitzpatrick *at al.* (2008) show that paired-associate learning can be effective, especially when large corpora have to be learned in a limited time. The same study provides evidence for the hypothesis that paired-associate learning is effective for long-term retention and further studies by Bahrick *at al*. (Bahrick *et al.*, 1993; Bahrick and Phelps, 1987) support this claim. These findings appear to validate the mechanism of direct L1-L2 word pair learning, employed by DVTs.

However, effective strategies and memorisation techniques alone are not enough when it comes to successful vocabulary learning. We must step back for a moment and consider what role motivation plays in the learning of L2 vocabulary and how game design features of DVTs can create a conducive learning environment.

Chapter 4 Motivation and game design in vocabulary learning

In an investigation of DVTs, it is crucial to assess the importance of motivation, to explore the relationship between DVT design and digital game theory and to consider how particular features of digital vocabulary trainers relate to theories of motivational strategies.

4.1 The importance of motivation in learning

Keller (1983:389) defines motivation broadly as '… the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert in that respect'.

In their seminal work on L2 learning and motivation, Gardner and Lamberts (1959) divide motivation into integrative (coming from a desire within the individual) and instrumental (motivation caused by factors outside the individual) strands. Gardner's later work (1985, 1988) refines the model further to acknowledge the effect of attitude of the L2 learner towards the target language culture. Crookes and Schmidt (1991) however point to the difficulty of finding conclusive evidence on whether and to what extent motivation and attitude to L2 learning correlate.

Keller (1983) proposes an education model consisting of four essential determinants for motivation:

1. Interest, i.e. pre-existing curiosity in the learner

2. Relevance, i.e. needs must be met by the course content or activity design

3. Expectancy, i.e. if learners expect to win they are more likely to succeed

4. Outcomes, i.e. rewards or punishments.

Following a long tradition of research into the nature of motivation, more research has become available to seek answers to the question of how theoretical findings can be used to inform pedagogy (Guilloteaux and Dörnyei, 2008). In particular, what kind of motivational strategies are employed to motivate learners? The researchers define motivational strategies as:

> '… (a) instructional interventions applied by the teacher to elicit and stimulate student motivation and (b) self-regulating strategies that are used purposefully by individual students to manage their own level of motivation' (Guilloteaux and Dörnyei, 2008:57).

Dörnyei (2001) formulates a framework for motivational strategies in teaching practice, consisting of four components:

1. Creating motivational conditions
2. Generating motivation
3. Maintaining and protecting motivation
4. Encouraging retrospective self-evaluation

The process is considered to be cyclical, blurring the lines between the distinction of motivation as a cause or as a consequence of learning.

In their study, Guilloteaux and Dörnyei (2008) investigated the relationship between the teacher's use of motivational strategies, students' self-reported motivation and actual classroom behaviour. Results suggest that where teachers employ motivational strategies in their teaching, levels of motivation in students increase, which is evidenced in greater student involvement and more active participation.

Examining Guilloteaux and Dörnyei's *'25 observable variables measuring teacher's motivational practice'*, it could be argued that it is difficult to distinguish particular motivating strategies from good teaching practice. Equally, the variables suggested for measuring student behaviour leave scope for variation in the way these are interpreted (e.g. 'attention – students appear to be paying attention'). Furthermore, replication of the study with Western students – in the reported study participants were ESL (English as a Second Language) students in South Korea – and different age groups could cast further insight into whether motivation is also age- and culture-dependent. The authors conclude that there is a demonstrated link between student motivation and achievement. Further research would be useful to establish how teaching and learning conditions can be optimised for maximum benefits.

Motivation is a factor that affects all aspects of learning. Tseng and Schmitt (2008:359) discuss motivation in the context of vocabulary learning and conclude that 'motivation is multidimensional in nature but also that it rarely remains constant in practice, instead going through a number of interconnected processes in terms of initiating, maintaining, and reflecting upon acts of learning in a task'.

Motivation generally fluctuates (Dörnyei, 2000; Ushioda, 2001) and the initial motivation displayed by beginning students is difficult to sustain over time and generally decreases (Dörnyei and Csizér, 2002; Gardner, Masgoret, Tennant and Mihic, 2004). In order to counteract the decline of motivation while pursuing the meeting of goals, students must make a sufficient time investment to maintain their motivation (Williams and Burden, 1997).

Does increased motivation lead to improved performance? A study by Ma and Kelly (2006) in which performance and participation in a CALL (computer- assisted language learning) programme were correlated found that despite one of their research participants not enjoying the CALL programme, he performed above

average. The authors conclude that 'learner attitude toward the learning tasks does not greatly affect the learning result' (Ma and Kelly, 2006:35). They also found that negative attitudes towards the learning programme (resulting in lack of motivation to use the programme) resulted in below average test scores.
However, it must be stressed that evidence from only one participant can hardly be the basis for a general conclusion.

Based on Ma and Kelly's observations, can it therefore be assumed that positive attitudes to a programme produce better results or is the engagement pattern more important for the improvement of vocabulary learning?

In order to attempt to answer this question, it is essential to have a closer look at how digital game theory can aid the process of vocabulary learning before assessing DVTs in more detail in the next chapter.

4.2 Game design and vocabulary learning

Research in game design theory has shown that, computer-based, educational games can have a positive effect on learning, especially in cases where the type of game activity is matched to the learner's preferred learning style (Prensky, 2003; Chong *et al*., 2005; Rapeepisarn *et al*., 2008). Users of game-enhanced problem-based learning often report their experiences as 'fun' and 'motivating'.

This brings the discussion to a fundamental role DVTs play in vocabulary learning. The intrinsic desire to learn vocabulary to communicate is the starting point for each language student. But there is naturally interplay with extrinsic motives, such as wanting to improve grades or competing with other students. Yet the learning setting limits the opportunities for extrinsic rewards. The majority of DVTs (apart from very basic ones) contain many elements of gaming design. The concept of gamification

has entered many sectors of education and industry and it is now believed that behaviour can be changed and learning can be improved, if motivational game mechanics such as rewards, incentives and instant feedback are utilised to encourage learning.

In a trial of gamification in online courses by the Kaplan University (DeHaven and Ferebee, 2012) showed that students engaged more with the gamified version of the course than the traditional version. The use of instant feedback, sonic feedback or achievement of levels were typical elements of gamification.

Kapp (2012) in *Games, Gamification and the Quest for Learning* proposes that the advantage which gamified learning has over traditional learning is the frequency and intensity of the feedback. The practice of using gamification elements in education is becoming increasingly more popular, although it is at the moment lacking academic research studies which empirically evaluate the concept, in particular with reference to DVTs or digital flashcard learning.

However, Sykes and Reinhardt (2013) argue that game dynamics can be harnessed for the purpose of L2 teaching and learning. The authors explain how game-informed pedagogy can motivate and engage and conclude:

> ‘Gamification is not about making the hard easy but making learning engaging and developing the literacies that students need in the future.’

Koster (2010) explains in his *Theory of Fun for Game Design* that the fun derived from games comes from mastering a set of skills. Fun is not usually equated with learning large quantities of facts and words.

Sykes and Reinhardt (2013) examined the relationship between perceived agency of the learner in game-enhanced language learning and how this affects motivation.

In addition, they were interested in which way feedback in games can be purposefully used in an L2 context. The authors also discuss that while the use of games and game features can enhance learning and motivate learners, it is also important to bear in mind that the use of these tools needs to be grounded in pedagogy.

One of the most fundamental aspects of game design theory is its link to Flow Theory, proposed by Mihály Csíkszentmihályi (1996). Flow is a mental state in which concentration is intensive and focused. All emotions are channelled towards one goal. Nakamura and Csíkszentmihályi (2001) formulated six factors which result in an experience of flow:

1. Concentration is focused on the present.
2. Action and awareness become one.
3. Loss of self-awareness.
4. Feeling of being in control of the situation.
5. Perception of time is altered.
6. Considering the experience of the activity itself as intrinsically rewarding.

In order to achieve the flow state, three conditions must be fulfilled (Csíkszentmihályi, 1996): goals must be clear, feedback immediate and there must be a balance between the opportunity presented and the capacity or ability of the person involved in the activity.

The concept of overlearning, i.e. presenting challenging learning material in a variety of ways and through a range of media, so that learning can be consolidated and any gaps can be filled, is supported by the application of the flow model in education. Egbert (2003) examined how the flow model can be applied to the language classroom and reports positive findings. However, she also concludes that

more research needs to be carried out into how flow can be implemented and grounded in pedagogy.

A learner-centred approach and a thorough understanding of engagement patterns and wider context of the learners' circumstances can provide more effective scaffolding. This would help learners realise their goals. The 'Ecology of Resources' model (Luckin, 2008) also stresses that with ever-increasing learning technology, not only learners but also teachers will benefit from learning how to use tools to maximum effect. Sykes and Reinhardt (2013) conclude that it is important that both teachers and learners must become familiar with game discourse and they also suggest that further training and research is needed.

Chapter 5 Vocabulary learning with DVTs

CALL has undergone tremendous changes since its first emergence. The development of CALL can be divided into three main phases (Warschauer, 2000; Yang, 2010). Behaviourist CALL dominated the 70s and early 80s and programmes focused largely on form, i.e. accuracy. In the 80s and 90s the focus shifted away from accuracy and explicit teaching, towards a greater emphasis on language use and fluency, based on the communicative teaching approach. CALL in the 21 century largely focuses on the integration of different skills, multimedia and the internet, with the end-user at the centre as the decision maker. Garrett (2009) comments on the three, initially, separate strands of pedagogy, theory and technology and how these have become more convergent over the last three decades.

5.1 CALL and vocabulary learning

Earlier, entirely behaviourist DVTs often lacked the sophistication of current ones and only had a limited variety in activities (Ma and Kelly, 2006). DVTs were usually part of an entire language course, rather than a stand-alone application. However, with incidental vocabulary learning no longer being viewed as the most effective way of learning new words, more systematic, explicit approaches to vocabulary learning became more favoured (Godwin-Jones, 2010). This shift, coupled with advances in technology, led to an increased use of digital flashcards for vocabulary learning. At this stage, it might be useful to note that throughout this dissertation, the terms ‘flashcards’, ‘flashcard programmes’, ‘flashcard software’ and ‘digital vocabulary trainers (DVT)’ are used interchangeably. What the term means in the context of this study is as follows: a digital application which in its most limited form

will allow the user to learn vocabulary in L1 and L2 pairs by studying words on two 'sides' of a digital flashcard. Many of these DVTs also feature a number of study and consolidation modes. For example, straightforward 'flipping' of flashcards will support initial study of words, whereas activities such as testing, matching or typing words help to consolidate.

As already discussed earlier, language students employ a range of strategies when learning vocabulary. The taxonomies proposed by Schmitt (1997) and Nation (2001) and synthesised in Table 1 give an overview of the types of strategies used at different stages in the learning process. These also apply to learning with vocabulary trainers. Flashcards and word lists can be used to determine the meaning of words and therefore contribute to the discovery of meaning. Once this has taken place, learning is consolidated through a range of memorisation strategies, i.e. linking L1 to L2 equivalents (e.g. when responses are prompted in L1 or L2), cognitive strategies such as offering opportunities for active recall of vocabulary and metacognitive strategies by providing a variety of learning modes to select from.

Vocabulary learning through CALL fulfils a number of pre-requisites associated with successful vocabulary learning:

1. As there is consensus that learners must have a considerably large vocabulary (approx. 3000 word) to make sense of non-specialist texts (Laufer,1997; Nation and Nation, 1990), CALL programmes or, more precisely, DVTs can support the learning of a large number of items in a relatively short period of time (Groot, 2000).

2. The integrated use of CALL in a classroom/instructed learning environment means that pre-teaching of vocabulary can be delivered through CALL, without encroaching on valuable classroom time (Allum, 2004).

3. Immediate feedback capabilities of vocabulary learning programs render this learning mode more efficient than traditional, paper-based activities and also increase learner motivation (Allum, 2004; Nelson 1998).

4. Web-based programs have the added value of being available for use on mobile devices and thus aiding mobile learning in learners' spare time (Chen and Chung, 2008).

On the other hand, decontextualised vocabulary learning is often criticised because the lack of context makes it difficult to learn and remember the word pair in the first place (e.g. Judd, 1978). Secondly, learning a word in isolation does not help the learner to know how to use it in context (Burroughs, 1982) and thirdly, that there are too many words to learn and that students would be better off to learn strategies for inferring meaning from reading (Anderson and Nagy, 1992: in Nation, 2001).

Before taking a closer look at a selection of DVTs, it may be useful to examine how flashcard programmes are designed and how this design helps in the process of vocabulary learning.

5.2 Flashcard programme design

The multimedia capabilities of many of the flashcard programmes available go beyond the simplistic presentation of word-word translations and allow both sound and images to be added. This enhanced mode of presentation is superior to any paper-based approach as it helps to cater for students' varied learning preferences.

As can be seen from the flashcard review that follows, some programmes are designed to offer a more individualised learning programme by keeping track of the learning progress and modifying the sequencing of flashcards according to the ease with which the meaning is recalled (van Bussel, 1994; Nakata, 2008; Pyc and Rawson, 2007, 2009; Siegel and Misselt, 1984). The specific algorithm that underlies the programme is based on the notion of the positive effect of 'expanded rehearsal'. Expanded rehearsal refers to a specific review schedule, in which the intervals between study sessions are increased. Many practitioners believe that this is the most effective way of learning and reviewing vocabulary (Baddeley, 1997, pp.112-4; Ellis, 1995; Hulstijn, 2001; Pimsleur,1967).
Research by Baddeley (1990), Bloom and Shuell (1981) and Dempster (1987) show that expanded rehearsal, also known as 'spaced repetition' is highly effective as it spreads repetition over a larger period of time.

Before investigating how spaced-repetition is implemented in DVT design, a closer look at the underlying theoretical framework on which the concept of spaced repetition practice is based, will aid understanding of why the approach is considered effective.

5.3 Spaced repetition

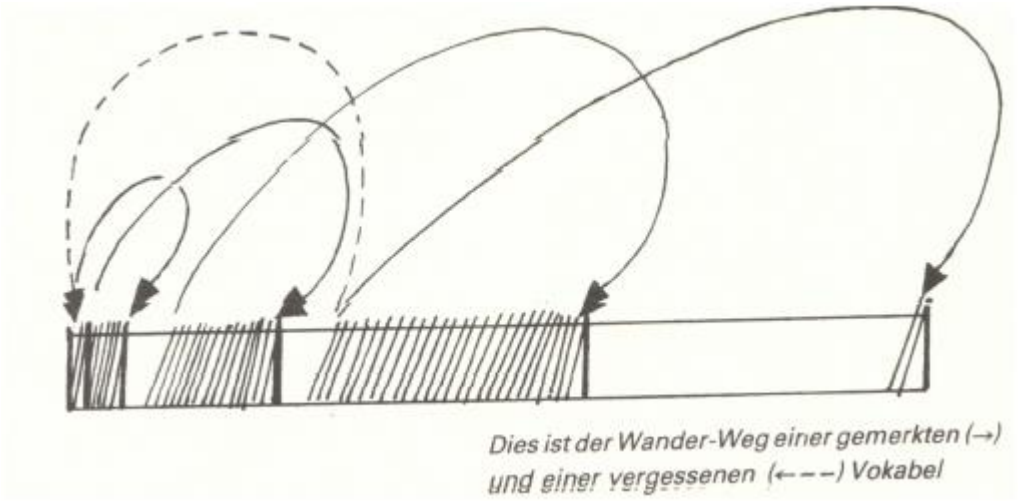
The method is based on Pimsleur's (1967) memory schedule, which had been informed by findings from research into memory by Seibert (1927, 1930) and Anderson and Jordan (1928). According to them, most of what is to be learned is forgotten straight after the initial encounter but the rate of forgetting decreases as time goes on. This theory is also supported by more recent research by Bahrick (1984) and Bahrick and Phelps (1987).

Pimsleur's memory schedule gives a rough guidance to the repetition schedule. The first repetition should be after 5 seconds – the scale is exponential, thus the next interval would be at $5^2 = 25$ seconds, then $5^3 = 125$ seconds etc.

Baddeley (1990) explains the positive effects of the method by referring to physical changes in the brain which cause long-term learning. Because of the prolonged, repeated learning process, spaced repetition allows enough time for neuro-chemical changes to take place in the brain.

Another dimension of spaced repetition is the grouping of items to be learned into how well the items are known, which means more attention is given to those words which are not known as well as others. This method was devised by the German science journalist Sebastian Leitner (1972) in the 70s. Flashcard applications which feature spaced-repetition systems are based on this learning theory.

Figure 1 – The Leitner Cycle: 'The path of a remembered word and a forgotten word'



(,The path of a remembered (→) word and a forgotten (← ––) word'; source: Leitner, S. (1991:71)

Wozniak (1990) designed a computer programme that allowed learning items to be learned and revisited at particular times. The optimum interval between repetitions was calculated on the basis of the total time available and the user's priority assessment of each item. This led to the development of a series of versions of the SuperMemo algorithm and programmes. In 2013 SuperMemo 16 focused on the method of 'incremental learning', i.e. using a spaced repetition model for chunked learning, i.e. grouping items of learning into 'chunks' to break down large learning processes, that can be drilled and revisited over time.

While incremental and spaced-repetition learning encourage positive attitudes to learning and lifelong learning, adhering to such a structured learning schedule can be problematic for adult, part-time students. Following such a programme necessitates total commitment, if good results are desired. For some learners this may simply be unrealistic.

However, the fact that DVTs support chunked (i.e. ‘bite-sized’) learning over short study periods, as opposed to mass practice, in which a large amount of factual information is crammed in long study sessions, it is essential to examine the concept of so called ‘bite-sized learning’ more closely before considering the processes involved in vocabulary learning with DVTs.

5.4 Bite-sized learning

Donovon and Radosevich (1999) researched the effects of distributed learning (spread over a period of time at particular intervals), in particular the question of the effects of massed versus spaced practice. They found that spaced learning was significantly higher than learning under massed practice conditions. However, they also concluded that the learning task itself and the interval length were important factors contributing to the overall effectiveness of distributed learning. The types of tasks that benefit from spaced practice are those of lower complexity. For more complex tasks there was only little evidence of any significant results.

Bite-sized learning became a common term when the BBC introduced its ‘bite-sized’ learning programme in 2002. Emerging technologies adopted the approach which is not only at home in education but also in vocational training. The notion of ‘learning on demand’ and of knowledge acquisition in form of ‘bite-size chunks’ (Armstrong and Sadler-Smith, 2008; Dede, 1996) at one’s own pace is supported by the plethora of platforms available to enable mobile learning.

While DVTs are not solely accessible on mobile platforms, their capability to be used ‘on the go’, is one factor which has contributed to their general appeal. But what else do they offer?

5.5 Vocabulary learning with DVTs

As already seen, DVTs have become widely available and are used by institutions and individuals worldwide, not only for language learning, but for any fact-based learning.

Whole online communities of DVT users have arisen around flashcard creation and sharing but, in the end vocabulary learning is generally an activity which takes place privately. So when studying on one's own, the competitive factor in improving one's own scores in interactive vocabulary games may be motivating and stimulating for some language learners. However, the opportunity to receive instant feedback on one's answers when using online, interactive flashcard systems and their associated study tasks is also motivational and contributes to the overall effectiveness of learning (Ariew and Frommer, 1987; Cobb and Stevens, 1996; Kang and Dennis, 1995; Kulhavy and Wagner, 1993; Robinson, 1991). A further advantage of making use of DVTs is that they offer individualised learning opportunities (Nelson, 1998) by selecting those items that have been memorised from those that need more attention.

To offer a better understanding of the flashcard palette, here is an overview of some of the major programmes available either commercially or free, web-based or downloadable.

5.6 Flashcard programme review

A systematic overview of some of the most commonly used flashcard programmes indicates that many of the DVTs are similar in their capabilities but that there are three main dividing factors: whether the programme is web-based or downloadable,

whether items are presented randomly or based on previous performance and thus spaced according to how well the items are known and whether the sets are pre-determined (e.g. by authors, teachers) or user-generated.

While at their very core, DVTs work on forming, strengthening and stabilising memory pathways in a variety of activities, not all DVTs are the same. Godwin-Jones (2010) points to the increased sophistication of electronic flashcard programmes, which have capabilities for sharing of vocabulary sets among users and the rapidly growing mobile versions of many of these programmes. What follows is an overview of some of the features of such applications. Table 2 gives an overview of some of the more prominent DVTs on the web in 2014/2015, focusing on some of the distinguishing features. It is important to stress at this stage that this is a very fast-changing area and programmes come and go. Nevertheless, most features are generic and therefore useful for evaluation purposes.

- **Cost**

DVTs vary in terms of cost: some programmes such as StudyStack and Anki are completely free of charge, while others offer free basic accounts, with optional upgrades for either an advertisement-free environment (Quizlet) or for enhanced features or unlimited use (e.g. vTrainPro).

- **Web-based vs. download**

Those DVTs, which are either free of charge or do not contain spaced-repetition elements, are web-based and are generally offered across a range of platforms, including mobile devices (although support for Blackberry handheld devices is still scarce). Downloadable DVTs are those which offer a premium service (for a fee) and those that can track individual learners' progress (often running a spaced-repetition algorithm).

Selecting web-based or downloadable DVTs will depend on students' preferred learning style and location. Downloadable DVTs give a greater sense of ownership while web-based programmes focus on the idea of collaboration and sharing of resources.

- **Spaced repetition**

Because of the tailored, individualized learning programme, which forms the basis of spaced repetition software, progress is closely monitored and shortfalls in learning are automatically addressed by the programme, so that more learning opportunities are created. However, learners need to be committed to the demands of the programme and invest sufficient time to follow the study schedule. DVTs with a spaced repetition pattern often remind users to continue their studies, which can either be motivating or irritating, depending on frequency and wording of these reminders.

- **Printable paper flashcards**

Only a few DVTs (e.g. StudyStack and Quizlet) allow the user to print out flashcard sets. There are various options as to the format of the printout. Options range from simple lists to various sizes of paper flashcards. SRS systems do not generally contain this option, while some programmes (Cram) only offer the feature to premium users.

- **Image support**

The majority of programmes support image files – these can either be learners' own images or images sourced from e.g. Flickr (Quizlet). Visual learners benefit from this support; however, image support may be beneficial and manageable at beginners'

level but as language becomes more abstract at higher levels of study, there will be fewer opportunities to support meaning with images.

- **Audio support**

Not all of the DVTs support audio and among those that have additional audio support, the provision varies. WordChamp lets the learner hear the word and then record and compare their own recording, by shadowing a model. Other programmes allow use of one's own sound files to be attached to the term. Quizlet uses text-to-speech audio as an option during the presentation stage and has also developed a dictation type task for testing vocabulary knowledge and spelling.

- **Quality of vocabulary sets**

Where vocabulary sets are user-generated, the quality of the translations is unknown. This can naturally be a potential problem. However, some programmes encourage review, discussion and scoring of sets to give some scope for peer feedback.

- **Flashcard creation by user**

Two of the better known flashcard programmes, SuperMemo and Duolingo, lack the facility for users to create their own flashcards (in the case of Duolingo, sets are created by 'Incubator volunteers' who create sets which then undergo various approval stages). Instead, these programmes come with ready-made flashcard sets. Other programmes, such as Anki, StudyStack and Quizlet consist entirely of user-generated flashcard sets. One could argue that the quality of the sets produced is questionable. For those learners who upload their own sets, the creation of flashcards in itself is engagement with the vocabulary and thus supporting learning

(Böhlke, 2002; Burston, 2007; Foster, 2011), but as indicated this can lead to errors in the translated word pairs which will then be learnt incorrectly.

- **Judgements of learning**

DVTs with an underlying spaced-repetition structure need learners to make judgements on how well they think they know particular items, e.g. ‘don’t know’, ‘easy’ etc. This will determine the repetition schedule and order in which these items will be presented again.

In a study by Kornell and Bjork (2008) students’ self-regulation when deciding when to ‘drop’ flashcards, i.e. when they think they know the item well enough not to have to study it any further, was investigated. The authors argue that in order to make effective decisions about the learning material and schedule, students must demonstrate accurate meta-cognitive skills to judge when and what to drop in favour of what and why. In an experiment in which students self-regulated their study of flashcards, results showed that participants’ decision as to when to drop flashcards was flawed. In many cases items were dropped after the first correct recall, resulting in poor performance in subsequent tests. Based on their findings, the authors suggest that learners do not fully understand the principles of learning and forgetting and therefore select ineffective strategies for managing their learning. In practice, this means that learners need to have a better understanding of how learning takes place to make best use of the method.

- **Exportable**

Once material is uploaded onto programmes such as Anki and Quizlet, it is possible for any user of the flashcard set to download the list and export the data e.g. on a spreadsheet. This means that students can create their own sets, by selecting,

refining, and regrouping other users' vocabulary according to their own needs and interests.

- **Presentation and retrieval mode**

Nakata argues that good flashcard software must have both presentation and retrieval modes, and must 'provide various types of exercises, increase retrieval effort, promote generative use, be flexible about the block size…' (Nakata, 2011:21). All of the evaluated software programmes contain presentation modes and drills and tasks which practise retrieval.

The presentation mode is vitally important – without first exposing learners to this stage, users would go straight into testing, without prior learning of the vocabulary. Retrieval modes vary in different DVTs, but Nakata categorizes retrieval practice into four types: receptive recall and receptive recognition, and productive recall and productive recognition.

1. Receptive recognition refers to linking meaning in L1 to the L2 word (e.g. matching exercise)

2. Productive recognition refers to choosing the target language word (e.g. multiple-choice task)

3. Receptive recall refers to producing the meaning of the L2 word (e.g. writing the L1 translation)

4. Productive recall refers to producing the L2 word itself (e.g. writing the L2 translation)

- **Size of word sets**

Where the programme is schedule-free (i.e. not an SRS), it is useful for the learner to be able to control the size of vocabulary to be learned and revised in any one

session. There are conflicting views of the optimal size of the set, but generally smaller sets may be more manageable and motivating to study than larger sets.

Table 2– A review of common flashcard programmes (current as of January 2015)

	Cost	Web-based or download ?	Mobile Version ?	Spaced repetition ?	Printable ?	Image support ?	Audio support ?	Flashcard creation by user ?	Exportable ?
SuperMemo http://www.supermemo.com/	Latest version $60.00	download	Available for Microsoft Windows mobile up to version 6.5.3 (mobile& PDA)	✔	X	✔	✔	X	✔
Anki http://ankisrs.net/ http://ankiweb.net (for mobile use)	free	download	Available for Windows, Mac, Linux, iOS, Android; devices with web browsers	✔	X	✔	✔	✔	✔
VTrain http://www.vtrain.net/	free and limited version: VTrain Free or unlimited version VTrain Pro for a minimum donation of $9	download	Some third-part software for mobiles and PDA; mobile version planned: http://www.vtrain.net/down9.htm	✔	X	X	X	X	X
OU Flashcard Maker	Part of OU Course	download	Not available	X	X	X	X	✔	X
Quizlet http://quizlet.com/	free; upgrade $15	web-based	Free versions available for iphone, ipad and android	X	✔	✔	✔	✔	✔
StudyStack http://www.studystack.com/	free	web-based	Not available	X	✔	X	X	✔	X
Studydroid http://studydroid.com/index.php	free	web-based	Available as an android app in google play	X	✔	✔	✔	✔	X

	Cost	Web-based or download ?	Mobile Version ?	Spaced repetition ?	Printable ?	Image support ?	Audio support ?	Flashcard creation by user ?	Exportable ?
Cram http://www.cram.com/	free	web-based	Some third-part software for iOS, Android and Windows Mobile	X	only with premium account	✔	✔	✔	X
DuoLingo https://www.duolingo.com/	free	web-based	Available as an app for iphone, ipad, google play app, windows phone	✔	✔ Lists are available but not in specific print format	✔	✔	X	X
Memrise http://www.memrise.com/	free; premium version available for access to larger vocabulary for $59.00 per year	web-based	Available as an app for iphone, ipad and android devices	✔	✔ Lists are available but not in specific print format	✔	✔	✔	X

Chapter 6 Research questions

Based on current research into the literature relating to the main themes of the investigation, the present study seeks to answer the following questions:

Research Question (RQ) 1: To what extent does performance on L1-L2 vocabulary tests vary when a DVT is used for vocabulary learning?

RQ 2: What are the perceived effects of DVTs on performance in vocabulary learning?

RQ 3: How do mature students in a distance learning context use DVTs?

RQ4: To what extent do DVTs affect users' learning motivation?

RQ5: How do students view access to preloaded course-specific vocabulary sets?

The next part of the report will outline the learning context and study itself, before considering which methods were chosen to answer the research questions.

Part II The study

Chapter 7 Learning context for the study

So far, the discussion of vocabulary learning has centred on the learner and many of the studies undertaken to support particular views of vocabulary learning have been based on observations from traditional, classroom-based teaching. But how are languages learned when the students are adult learners who are studying language courses in a distance learning context? It may be useful to first of all define what is meant by 'distance learning' in the context of this particular research and then to consider the relevance of age of learners in this particular setting before outlining the study itself.

7.1 Distance learning in general

Distance learning or distance education is not a new phenomenon. Holmberg (2005) reports that the first distance course was mentioned in the 'Boston Gazette' in 1758. The first known distance course which was based on correspondence between teacher and student was developed by Sir Isaac Pitt (Moore and Kearsley, 2005). In 1858 the University of London offered the first university degree via its External programme. In 1926, J.C. Stobart, an employee, voiced the idea of a 'wireless university', an idea, which was much later taken up again by Michael Young in 1962 who proposed an 'open university', 'a college of the air', which would deliver higher education to all in collaboration with the BBC. The idea of educating at a distance was linked to advances in innovation and technology throughout: from the introduction of uniform postage, the birth and popularity of TV and radio, to the internet and the fast-evolving web technologies.

Distance education today usually refers to synchronous teaching, i.e. teaching in 'real time' in face-to-face environment, or online, asynchronous, i.e. teaching and learning do not occur simultaneously, or 'blended learning', where tutors and students are not at the same location for the majority of study time. Typical examples of synchronous learning are video or audio conferences in real time, while asynchronous learning does not require the learner to be present at particular times and in specific places. Examples of asynchronous delivery are the use of emails, forums or wikis. Today, the term 'blended learning' refers to a combination of synchronous and asynchronous delivery methods coupled with face-to-face meetings and is an approach employed by The Open University.

The term 'blended learning' appeared for the first time in 1999 in a news release from the Atlanta-based computer training business 'EPIC learning'. However, the term was then not very clearly defined in terms of whether instruction was virtual or face-to-face. In general, the term was open to different interpretations until Bonk and Graham provided a less ambiguous definition in their *Handbook of Blended Learning* in 2006. In the first chapter of the publication, Graham defined 'blended learning' as learning systems which 'combine face-to-face instruction with computer mediated instruction' (p.5).

A similar idea of teaching and learning can be found in the concept of the 'flipped classroom'. According to the two pioneers of the methodology Bergmann and Sams (2014), valuable class time or face-to-face time with an instructor in vocational training can be saved by 'flipping the classroom', i.e. students are given access to pre-recorded lectures or other instructional videos to prepare for contact time with their tutor or instructions. This way, it can be ensured that students come prepared and that classroom time is spent on deepening their understanding, rather than presenting new information:

> ‘an effective method to ensure that adult learners are prepared is to design a system that prevents the learner from scheduling the face-to-face session until after he has completed the pretraining session. In addition to preventing individuals from arriving for training unprepared, a system of filtering out unmotivated learners is established’ (2014:3)

The ‘Flipped Learning Network’ distinguishes between the terms ‘flipped classroom’ and ‘flipped learning’ and defines the concept thus:

> ‘Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.’ (http://fln.schoolwires.net/cms/lib07/VA01923112/Centricity/Domain/46/FLIP_handout_FNL_Web.pdf)

While many of the examples of flipped learning rely on video input (often created by the teacher), this is certainly not a pre-requisite. The emphasis, however, is on web-based resources and a general multi-modality approach. This approach also allows provision for students with special learning differences, as learning is offered targeting different learning channels (‘multisensory’: visual, auditory, tactile, kinaesthetic) and thus giving multiple opportunities for ‘over-learning’. The term ‘over-learning’ refers to the teaching method used in particular with the aim to make teaching and learning more inclusive and to cater for a variety of learning styles. ‘Over-learning’ means that a range of teaching input is presented through different methods and resources to ensure that whatever gaps in learning there are initially,

these can be closed by students engaging with the subject matter a number of times in different ways.

The idea of flipping learning, i.e. getting students to cover, in their own time and space, what traditionally would be presented by the teacher, is part of the blended learning model and therefore an integral part of the learning environment in which the study is set. Where distance language learning is concerned this is already taking place to a large extent. What is happening to a lesser degree is the explicit teaching of vocabulary, treating vocabulary learning as a discrete unit of teaching and learning.

In the Presentation-Practice-Production approach, a common teaching method in ESL/EFL (English as a Foreign Language) and MFL (Modern Foreign Languages), vocabulary and structures are introduced by the teacher and links are made to already existing knowledge of lexical items and structures in form of pre-teaching activities. But what if the process were to be flipped, and students were tasked with learning and revising vocabulary before the practice and production stage? While the learning of decontextualised lexis has been criticised, it has also received support, if the process is carried out under optimal conditions. Hunt and Beglar (2005) refer to research into the merits of explicit vocabulary teaching (Coady, 1997, Prince, 1996, Nation, 2001) and conclude:

> ‘In sum, the ….research indicates both the effectiveness of explicit instruction and learning and the problems of inferring vocabulary from context; this supports the view that teachers should provide systematic, explicit vocabulary instruction directed at the expansion, consolidation, and elaboration of their learners' lexicons. Yet, we would emphasize the advantages of rapidly integrating decontextualized lexis into contextualized,

> meaning-based tasks in order to develop and strengthen connections among individual lexical items…as a supplemental activity, teachers can introduce vocabulary cards as an efficient way to speed up the *initial* process of lexical acquisition. Many learners value the explicit study of vocabulary and vocabulary cards are a potentially self-initiating activity that can promote autonomy. Although we are unaware of research concerning the potential advantages of autonomy and personalization where L2 vocabulary learning is concerned, studies of human motivation (e.g., Deci and Ryan, 1985) and L1 vocabulary acquisition (e.g., Kamil, Mosenthal, Pearson, and Barr, 2000) strongly suggest that both of these factors can exert positive influences on lexical acquisition; thus, investigating the effects of learner autonomy on explicit vocabulary learning could yield valuable findings.'(Hunt and Beglar, 2005).

Therefore, harnessing the multi-modal approach of blended-learning and the specific conditions of the flipped learning approach, approaching vocabulary learning with DVTs makes not only sense in distance education but is also relevant in other learning contexts.

7.2 Language learning at The Open University

The OU offers language study at 4 levels (beginners, lower intermediate, upper intermediate and advanced). Students on beginners' and lower intermediate language courses, which all carry 30 points, study around 8-9 hours a week. All other language courses (upper intermediate and advanced) carry 60 credits which require 16-18 hours per week of study (http://www.open.ac.uk/courses/do-it/finding-time). Students' learning is supported by materials in the form of books, audio CDs and DVD/video clips. Learning and teaching is organised within a Virtual Learning

Environment (VLE) in which students have access to digital course materials, forums, wikis, glossaries, a flashcard maker and to virtual classrooms (using the Blackboard Collaborate 'OULive!' software programme). Audio conferencing is used for scheduled tutorials and other formal or informal meetings between students and tutors or among students. Assessment is carried out in the form of written and spoken assignments which are electronically submitted and marked by students' tutors.

Some new vocabulary is glossed and students are encouraged to make use of the 'Flashcard Maker', a downloadable software programme which allows upload of student-generated vocabulary sets and offers a 'flipping' card mode, so that L1 and L2 equivalents can be learned as pairs. Vocabulary is not trained discretely during course study but is practised and assessed in communicative tasks. Vocabulary is also assessed in online activities, consisting of a range of receptive and productive tasks.

Motivated by anecdotal evidence of students' vocabulary learning challenges, a study was devised to examine student engagement with digital vocabulary trainers (DVTs) to support vocabulary learning.

7.3 Mature adult students

The average age of OU students is 31, with 9% of students being over 50. It is also important to stress that the majority of students (71%) are in full-time or part-time employment whilst studying. 89% of students study with the OU to improve their careers (The Open University website, http://www.open.ac.uk/about/main/the-ou-explained/facts-and-figures, accessed 12 January 2015).

This means that the typical student will not solely focus on learning but will have other demands on their time and attention. Therefore, attitudes to teaching and learning will be different to those of pupils in full-time education. Ohly (2007) investigated the language learning strategies of older learners (50+) in talk aloud protocols and concluded that while the strategies used are not wholly different from those employed by younger students, adult learners are more aware of how to support their learning, have coping strategies to work through difficulties and are keen to practise and maintain their knowledge. Robinson (2005, cited in: Smith and Strong) also concludes that adults have greater cognitive abilities and capacity for more complex processing. Cohen (1998) also found in his research that children and adolescents find it difficult to explain their learning strategies or talk about their learning styles.

While there is some literature on language learning strategies in independent settings (e.g. Hurd and Lewis, 2008), there is only little research into learning behaviour of mature language students in distance education. To date, no research could be found that examined vocabulary learning with DVTs in the context of distance education where students are mature learners in Higher Education. Therefore it is hoped that this research can shed some light on this newly emerged strategy for learning and can make pedagogical recommendations and suggestions for future research activity.

The previous discussion of vocabulary learning strategies already indicated that some of the strategies from the social dimension, e.g. ‘asking teacher for paraphrase or synonym of new word’, are generally lacking in the particular learning context of Open University students. Of course, there are opportunities to ask the tutor and fellow students for clarification, but those times when students and teachers do meet are usually times when students have already encountered the

words used in previous, private study sessions and will, most probably, have checked their meaning.

Vocabulary learning is generally a private activity and therefore often taking place in an independent setting. Klapper (2008) emphasises the potential difficulty of vocabulary learning in an independent setting due to the lack of feedback and heavy emphasis on self-discipline and self-management. On the other hand, learners in distance education understand the importance of being organised and making decisions about their learning.

Nevertheless, if a tool such as a DVT can make the process of learning on one's own interactive, can provide feedback and motivation through a range of drill activities and games, then it might be seen as a bonus.

7.4 Overview of the study

The study consisted of four phases (Table 3):

PHASE 1: In the first phase of the study in October 2010, a control group was administered an online vocabulary test (English to German translations), based on one unit of their course materials, and was asked about their vocabulary learning strategies at the end of their 11 months' ab initio German course *Rundblick*. In addition, participants also completed an online Vocabulary Learning Questionnaire containing quantitative questions pertaining to e.g. preferred learning strategies, length of study and languages studied.

PHASE 2: In the second phase of the study, a treatment group (1st cohort: November 2010; 2nd cohort: November 2011) was given access to web-based flashcard sets of translated vocabulary to accompany their course materials and were encouraged to use the sets for initial learning. The treatment group was

surveyed longitudinally and completed three online vocabulary tests in total over the duration of the course. Tests 1 and 3 tested vocabulary from the same unit (Unit 2), while Test 2 consisted of vocabulary taken from two units (Units 2 and 4). Therefore Tests 1 and 3 had identical content. Beside this quantitative data collection method, participants received between 2-4 follow-up, open-ended questions after each of the three vocabulary tests, thus yielding qualitative data.

The treatment group was administered Test 3 (a retake of Test 1) at approximately the same stage in students' study as the control group had taken their only test. Just as the Control Group, the Treatment Group completed the Vocabulary Learning Questionnaire.

PHASE 3: In phase 3 of the study, 3 members of the Treatment Group (2nd TG cohort, 2012) participated in semi-structured interviews in the last quarter of the course. Participants were asked follow-up questions based on a number of themes emerging from the analysis of quantitative data gathered.

PHASE 4: The fourth phase of the study consisted of four separate focus group meetings, to discuss students' use and views of DVTs, and gathering further qualitative data. Each meeting took place online, using Blackboard audio-conferencing software used by The Open University for tutorials and meetings. Participants had not been previously surveyed and were drawn from the following Open University courses:

- German beginners
- French beginners
- Chinese beginners
- German lower intermediate
- French lower intermediate
- German upper intermediate

- French upper intermediate

7.5 Study participants

All participants who volunteered to take part in the research were mature students at The Open University (OU), a distance learning institution in the UK.

Participants of the first three phases of the study were drawn from the German beginners' course *Rundblick*, while the participants in the Focus Group came from current Chinese, French and German courses, ranging from beginners' to advanced level.

Control Group participants for the quantitative data collection phase were selected from the Open University German Beginners' course 'L193' cohort (who started study in November 2009) by the SSST (Student Statistics and Survey Team). The SSST selects student samples on the basis how often students have been sampled previously. As students had reached the end of their studies and thus had been surveyed on other occasions, a sample of 300 students, i.e. just under half of all L193 student in 2010, were invited to participate in the study. The same procedure was used for two cohorts forming the Treatment Group for the L193 2010 and 2011 intake, resulting in 569 invitations to students in 2010 and 488 invitations in 2011.

28 students (Control Group) consented to participate in the first survey. A total of 95 students participated in the Treatment Group (spread over two cohorts).

It is important to emphasise again that the 28 participants in the Control Group participated in the survey in October 2010 when they had already completed their German course. The fact that these students volunteered to participate in the survey may indicate that these individuals were motivated students who felt capable of contributing to the survey.

Participants from the Treatment Group (2012) were invited to participate in telephone interviews. Three participants volunteered to take part in these, which took place in the second half of their OU German course.

For the last stage of the research, students of German, French and Chinese courses were invited to participate in focus groups to investigate vocabulary learning patterns. A total of 10 students took part in three separate focus group meetings.

Table 3 – Schedule of treatment and data collection phases for the control and treatment groups

Phase	Time Scale	Sample	Action	Data (Data Type)
1	October 2010	**CONTROL GROUP** (28 participants; students at the end of their L193 studies; without access to preloaded vocabulary flashcard set)	administration of vocabulary test (Test 1) and Language Learning Questionnaire	➢ test scores nominal and ordinal data from questionnaire (Quantitative & Qualitative)
2	November 2010 & November 2011	**TREATMENT GROUP** (95 participants, consisting of 2 cohorts from October 2010 and October 2011 intake)	student access to preloaded vocabulary flashcard sets on Quizlet via links in Student Forum	
	February 2011 & February 2012		administration of Test 1, qualitative questions and Language Learning Questionnaire	➢ test scores ➢ responses to questions at the end of test ➢ language learning questionnaire nominal and ordinal data from questionnaire (Quantitative & Qualitative)
	April 2011 & April 2012		administration of Test 2 and qualitative questions	➢ test scores ➢ responses to questions (Quantitative & Qualitative)
	October 2011 & October 2012		administration of Test 3 (same as Test 1) and qualitative questions	➢ test scores ➢ responses to questions (Quantitative & Qualitative)
3	June/July 2012	**INTERVIEW GROUP** (3 participants from Treatment Group) (October 2011 intake)	follow-up telephone interviews	➢ transcriptions (Qualitative)
4	May 2013	**FOCUS GROUP** (10 participants from October 2012 cross-languages intake)	discussion of 8 guiding questions in online meeting	➢ transcriptions (Qualitative)

Chapter 8 Methodology

The research questions were formulated to accommodate both quantitative and qualitative methodologies. Purists may dispute the application of such a mix of methodologies but it was felt that combining qualitative and quantitative approaches and methods would enable a more in-depth investigation and thus improve the quality of the research. Onwuegbuzie (2009) argues that even quantitative methodology is not free from subjectivity on the grounds that researchers apply their own subjective judgements on which quantitative methods to employ in their research. While the quantitative methods selected for the study offered an answer to the 'what', i.e. any difference in performance levels between learners who use DVTs and those who do not, qualitative methods allowed for obtaining insights into the experience of individuals and inner processes. Johnson and Onwuegbuzie (2004:16) state that:

> 'mixed methods research is … […] an expansive and creative form of research, not a limiting form of research. It is inclusive, pluralistic, and complementary and it suggests that researchers take an eclectic approach to method selection and the thinking about and conduct of research'.

This research approach in which a combination of methods is employed is referred to as 'mixed method research' (Creswell *et al*., 2003). Onwuegbuezie (2009) explains that the term 'mixed research' is a more appropriate label as it comprises a mix of methodological approaches and a combination of research methods. This form of research approach has been used increasingly in applied linguistics since the 1990s (Dörnyei, 2007).

The purpose of such a method is manifold – a combination of both qualitative and quantitative methods enables the researcher to gain a wider and deeper

understanding of the subject matter. In addition, triangulation is facilitated through a broad range of data. When the two data sets complement each other, they can add to a more comprehensive overall picture. If, on the other hand, data diverges, illuminating discrepancies or contradictions, then this allows the researcher to investigate from a new angle (Mertens, 2005). Mertens also argues that pursuing a mixed method approach helps to understand both product and process and their relationship with each other.

Dörnyei argues that mixed methods research can help increase particular strengths in research design, while at the same time eliminating weaknesses. Especially where the participant sample size is low, it is difficult to arrive at representative results. While recognising the design difficulties of the study in terms of uncontrollable variables, quantitative data results were used to identify trends for further investigation. Furthermore, as Mertens (2005) explains using two methods in sequence means that based on the outcomes of one, the approach in the second method can be further developed. This was a useful strategy for the present study as the data sets from each phase shaped the research design of the next.

The quantitative strand of the research design allowed collecting nominal data to identify performance related trends in a translation test (a detailed description of the vocabulary test and other materials used follows in the section ‘9.1 Description of the study’). The collection of qualitative data on students’ learning strategies and preferences allowed gaining a more comprehensive picture of students’ perceptions and attitudes on a range of themes (tool preferences, engagement pattern, motivation etc.).

The results from an analysis of these data were used to give a tangible snapshot of performance, strategy use and preference for a fuller picture of vocabulary learning behaviour.

The decision to opt for mini focus group meetings (groups with about 3-4 participants) was taken because of the data type that had already been generated in previous phases of the main study (both qualitative and quantitative). Previously, in-depth interviews had been conducted which highlighted a number of issues which, it was felt, would be useful to explore by considering a number of different perspectives and views. Focus groups generate dynamic discussions and allow for interaction between participants to spark off exploration and discussion of latent issues.

The rationale for using both in-depth interviews and focus groups is because the two methods are complementary. The interviews allowed deep exploration of personal issues, while the focus groups aided considering the trends from different perspectives. Conducting focus group meetings helped an understanding of commonalities and differences in groups.

Choosing this method helped to chart a link between performance, learning preference and extent of DVT engagement. While the first research question ('To what extent does performance on L1-L2 vocabulary tests vary when a DVT is used for vocabulary learning?') was linked to a mainly quantitative research design through the use of a vocabulary test, the remainder of the research questions was concerned with students' perceptions and views of DVTs and therefore yielded qualitative data.

8.1 Description of the study

8.1.1 Study design Phase 1 and Phase 2 of study (vocabulary set, test, questionnaire)

A number of DVTs were tested prior to releasing the vocabulary sets. The selection criteria were based on a number of requirements.

The programme must /should be:

- free of charge
- user-friendly and easy to use and access
- web-based, i.e. online
- based on a spaced-repetition system
- allow the printing off of word lists
- have audio and image support
- have capacity for large sets
- have functionality for user-generated material upload and editing
- allow export of sets into other programmes or merging of sets
- have user-appropriate presentation and retrieval modes

8.1.2 Access to translated vocabulary sets

The vocabulary of the entire German beginners' course *Rundblick* was uploaded as a vocabulary set, consisting of a total of 4500 translated L1-L2 pairs spread over 12 sets to accompany the course units, using the web-based flashcard programme Quizlet (http://quizlet.com). Each set varied in size with an average of 375, with the smallest set of 282 (Unit 12) and the largest containing 493 pairs (Unit 7).

Due to ethical constraints, it was considered best if the control group, without access to vocabulary on Quizlet, would be populated with a group which was at the end of their L193 *Rundblick Beginners' German* studies already, rather than withholding access to Quizlet for a large part of the *Rundblick* students. This meant that the Control Group would only take one test at the end of their studies. This would then be comparable to the third test that the Treatment Group would take at the end of their studies. This explains why there is only one result for the Control Group for Test 3 (although the title is misleading as it was the only test the Control Group took but corresponds to the comparable test that was scheduled for the Treatment Group at the same time during their studies).

Apart from the Control Group in 2010, all subsequent students on *Rundblick* were given access to the vocabulary sets on Quizlet (Appendix 1). Details of how to access these were communicated via the Student Forum.

8.1.3 Vocabulary test

The vocabulary used in the test is derived from data uploaded for Unit 2 and Unit 4 on Quizlet (http://quizlet.com/1611510/rundblick-thema-2-flash-cards/ , http://quizlet.com/1659556/rundblick-thema-4-flash-cards/). The tests comprised 144 items, representing approximately 41% of the total of items presented. It was felt that a test consisting of more words would not suit the context, and external factors such as drop in concentration, fatigue, strain on upper body through typing responses etc. could have impacted on the result.

It was decided to only focus on and test most frequent words and words which would be used frequently in the learner specific-contexts (e.g. while a number of holiday-/tourism related words were not listed in the high frequency list (for example:

Fahrradverleih – bike hire*, Einzelreisender* – single traveller), these were still included considering the purpose of language study).

To determine the frequency of each individual item, the *Frequency Dictionary of German* (Jones and Tschirner, 2006) was used. Where some compound nouns were not included in the list, component parts were separated and ranked, where knowing the meaning of each individual noun, would help the overall understanding of the term (e.g. '*Einkaufszentrum'* – shopping centre: the verb '*einkaufen*' means 'to shop', the second part of the noun is a cognate, so the frequency of the verb '*einkaufen*' would determine the ranking of the word '*Einkaufszentrum*'). Where component nouns in a compound were in the same frequency bracket, the compound noun was assigned to that particular group. Where component parts varied in frequency, the frequency of the most salient part of the noun determined the overall frequency. All items were recorded in one of four frequency groups: 1-1000[3], 1001-2000, 2001-3000, 3001-4000.

Where the system of translating individual parts did not work (e.g. '*Krankenschwester'* – nurse: '*krank*' – ill, sick, '*Schwester*' – sister), or where a word was not listed in the frequency list, a different system of establishing frequency was used. In these cases, each item was searched through Yahoo.de and number of hits for each item recorded. As before, all items were recorded in one of four frequency groups, depending on the number of hits.

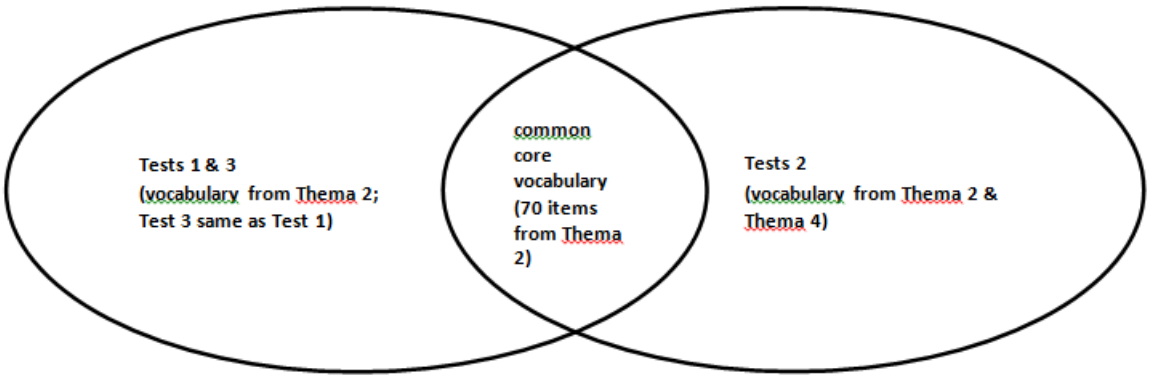
All items were then categorised into nouns, verbs, adjectives, prepositions, pronouns, conjunctions, past participles, adverbs, adjective/adverb, cardinal numbers. The ratio of the items in each category in relation to the total of all

[3] Jones and Tschirner (2006) compiled a frequency list ranging from 1-4034. For example, the conjunction "und" is ranked as number two, based on its occurence per one million words: 28445, making it a high frequency word, while the last ranked word"*zweifellos*" only occurs 16 times in a million occurrences, making it a less frequent word.

vocabulary for one particular unit was calculated. This factor was used to calculate the number of items from each category to ensure that the test items are comprised of a representative sample. The test items for all tests can be found in Appendix 2.

For Test 1 and Test 3 (a repeat of the first test at a later stage in the course) 144 test items were selected from the second unit, *Thema* 2, of the beginners course material *Rundblick.* The course consists of 12 *Themen* (units) spread over six course books. This represents approximately 40% of the entire body of vocabulary presented in *Thema* 2. Test 2 consisted of 144 items containing vocabulary from *Thema* 2 and new material from the fourth unit, *Thema* 4. Each of the 3 tests contained a 'core vocabulary' of 70 items taken from the *Thema* 2. This ensured that performance could be surveyed over time on the same items. The data analysis presented in this thesis refers only to performance in these 70 items. The corpus of 70 core items represented proportionally the distribution of word types (Figure 2).

Figure 2 – Composition of vocabulary tests



Once the list of test items was compiled, items were randomised and recorded on a Google interactive form, thus ensuring that the test could be completed online and all responses automatically recorded on a spreadsheet. (The test as administered to the CG is available at: http://tinyurl.com/2vnggs7 and is replicated in Appendix 3). For Test 2 and 3 surveymonkey.com was used instead of the Google document for easier access and superior data collection capabilities. Test 2, which was only administered to the TG is replicated in Appendix 4.

East test for the TG was also followed by a set of questions (quantitative and qualitative) exploring vocabulary learning behaviour and DVT use further (Appendix 5).

8.1.4 Vocabulary learning questionnaire

Before arriving at the present version of the vocabulary learning questionnaire, Oxford's (1990) 'Strategy Inventory for Language Learning' and Schmitt's (1997) 'Taxonomy of Vocabulary Learning Strategies' were examined. Oxford's Inventory proved too broad, encompassing all areas and skills associated with language learning and was therefore deemed inappropriate for the proposed study. While Schmitt's taxonomy included some strategies, which were relevant for this study, it was necessary to draw up specific questions to answer the formulated research questions. Part of the questionnaire establishes the participants' first language, language learning experience and access to internet. The remainder of the questions is centred on vocabulary learning strategies in terms of a. establishing meaning, b. recording vocabulary, c. revising/learning vocabulary, d. m-learning, e. e-learning. Participants responded on a 5-point Likert scale, ranging from *always, often, sometimes* to *rarely* and *never*. The questionnaire was presented online via SurveyMonkey, which stores responses and displays results diagrammatically (https://www.surveymonkey.com/s/DTQBJYG, Appendix 6).

8.2 Procedures for data collection

8.2.1 Initial contact and consent

Potential participants, whose contact emails were provided by SSST, were invited by the researcher's supervisor to participate in the research study (Appendix 7). The email contained a consent form (Appendix 8), with which students signalled their willingness to participate. Participants were ensured that, in terms of safeguarding, all personal details would be kept secure, communication would be kept confidential and data anonymised, as stipulated in the Data Protection Act, and that any qualitative data would be handled sensitively.

An application was made to the Human Participants and Materials Ethics Committee (HPMEC) and the standard Risk Checklist was completed. Approval was solely sought for Question 8 ('Will the study involve prolonged or repetitive testing?') as no other questions were applicable. The committee approved the application without any conditions.

Once consent was given, participants were sent the two links (see above) to a. the vocabulary learning questionnaire and b. the vocabulary test. Both questionnaire and test were required to be completed online and responses were collected by the programmes. While both questionnaire and test were anonymous, i.e. they cannot be linked to students' personal details or study records, the two parts could be linked together by a Participant I.D., which the participants chose for themselves (e.g. memorable word plus three digits).

8.2.2 Data collection

The test was uploaded, so that it could be taken online and in participants' own time. Each participant received the link to the test and information about the completion period (tests remained open for 2 weeks). The Control Group was only

surveyed once at the end of their studies (October 2010) and were administered Test 3, which is effectively the same as Test 1. The Treatment Group received links to three tests in total: Test 1 in February, Test 2 in April and Test 3 in October.

The data collection period spanned over 7 days and included a weekend. A reminder to complete was sent before the weekend to increase uptake over the weekend.

8.2.3 Data analysis

Scoring and coding

All responses in the vocabulary test were individually scored. The scoring was an adapted version of Watanabe's (1997) 0-3 point scale scoring scheme:

0 = no response or wholly incorrect response

1= a response containing 2 or more spelling (including gender) mistakes

2= a response containing 1 spelling mistake (or incorrect gender)

3= completely correct response – either own translation or translation as per translated vocabulary set

Data analysis

Data elicited in the survey was either tallied (e.g. number of responses etc.) and frequency ratings were coded (e.g. 'never' = 0, 'always' = 5).

A linear regression t-test was used to ascertain if there was a correlation between use of DVT and performance on a vocabulary test (in form of scores) in both Control and Treatment Groups.

8.3 Phase 3 of study (interviews)

Three quarters into the course, participants from the Treatment Group (2nd cohort) were invited (Appendix 9) to participate in telephone interviews talking about their vocabulary learning experience in general and with the flashcard programme. Three participants volunteered to take part in semi-structured interviews which ranged in time between 15 and 30 minutes. Interviews were recorded and transcribed. The interviews covered the following questions:

- Can you describe a typical vocabulary learning session?
- What do you perceive to be the benefits and disadvantages of using flashcards and translated word lists?
- What are its drawbacks in your opinion?
- Do you think vocabulary learning with flashcards has made an impact on the way you approach vocabulary learning?
- What is your view of access to translated word lists as flashcards or printed lists?
- Does the way you use flashcard programmes change according to whether you are at the beginning of a *Thema* or at the end?
- Would you use a flashcard programme for recording your own sets?

The interview data and data from other parts of the study were intended to provide the basis for assembling learner profiles, which would offer insight into the vocabulary learning patterns of different participants over a period of time. The literature review has not yielded many examples of single subject case studies (Segalowitz *et a*l., 1995). Fitzpatrick *et al.* (2008) carried out a case study of a single subject learning 300 Arabic words using word cards over a 20 day period. The authors conclude that ‘a study over 20 days may not be long enough for the really

important features of vocabulary learning to emerge' (p.6) and that 'single-subject case studies are a neglected resource in work on vocabulary acquisition' (p.11).

8.4 Phase 4 of study (focus group interviews)

In the analysis of both quantitative and qualitative data a range of themes was identified which was explored in focus groups, consisting of students from a new intake who had not previously participated in the study.

8.4.1 Participants

A focus group approach was selected as a means of collecting qualitative data to conduct a discussion on issues that had emerged in previous phases of the study. A cross section of Open University students on language courses (Chinese, German, Italian, Spanish, Welsh), ranging from beginners and intermediate to advanced levels were invited (Appendix 10) to participate in focus group meetings of approximately 45 minutes. 5 different meetings were offered (during the week and at the weekend, evening and daytime) which participants could select from. Participants were grouped and allocated to groups.

8.4.2 Method

The meetings were conducted via the audio-conferencing tool used by The Open University (Blackboard Collaborate programme). Four focus group meetings took place, in which a total of 10 students participated. All meetings were recorded and transcribed.

8.4.3 Interview schedule in Focus Groups

Results from an analysis of qualitative data derived from an analysis of open questions of the surveys and interviews, revealed that motivation was a prominent theme in data derived from participants. Although this had not been originally the main focus of the research, the strength and frequency with which motivation was mentioned in relation to DVTs, caused the investigation to examine the role of motivation.

The focus of the interview questions was whether participants who rate their tool skills highly also self-report positive effects on motivation and performance.
What are learners looking for in a programme which would make them select it for learning?

In Phase 1 of the study, participants rated the different types of tasks (e.g. spelling, game, seeing the paired associates together, multiple choice tests etc.) and functions of the tool. Which criteria do participants report as favourable and encourage engagement with the tool?

Data from previous stages of the study suggest that at beginners' level students start out motivated, engaging with flashcards more actively than further into their studies. Lack of time due to increased workloads was mentioned as a reason for this. The study would now examine the question of vocabulary learning in different languages and at different levels and whether engagement with the DVTs changes as learners become more proficient.
If students decide against the use of flashcards for vocabulary learning for certain skills, which skills are these, what strategies are used instead and what do students perceive to be the limitations of DVTs?

Therefore, participants in the focus groups were asked to discuss the following questions:

Question 1. What are the reasons and motivations for opting for electronic vocabulary training programmes for vocabulary learning?

Question 2. How do you feel using electronic vocabulary learning programmes has impacted on your performance?

Question 3. What effect do vocabulary training programmes have on your motivation?

Question 4. What do you perceive to be the advantages of learning vocabulary with the aid of electronic vocabulary learning programmes?

Question 5. What do you perceive to be the disadvantages of learning vocabulary with the aid of electronic vocabulary learning programmes?

Question 6. What selection criteria are applied when choosing one programme over another?

Question 7. Has the way in which you engage with electronic vocabulary trainers changed over time? Are there differences in use of flashcard programmes for vocabulary learning in different languages and at different levels of study, i.e. differences between beginners' and advanced level?

Question 8. Are there any particular tasks which require different strategies than those offered by electronic vocabulary learning programmes, i.e. what other learning strategies do you use for vocabulary learning?

These questions were the result of an analysis of qualitative data of the previous three phases. A rationale for each of the questions will be explored in the presentation of particular findings from the focus group meetings in the next part.

Part III Data analysis and findings

Chapter 9 Data analysis

9.1 Quantitative data

9.1.1 Vocabulary test

All responses in the vocabulary test were individually scored 0-3 (0 – completely incorrect response, 1 and 2 – partly correct (i.e. 1 – 2 or more spelling/gender mistakes; 2 – 1 spelling/gender mistake), 3 – completely correct.

The figure below (Figure 3) shows the overall 'correct' score which includes all responses where the correct meaning is conveyed or where the correct translation is attempted but where it contains spelling/gender mistakes. (Individual test scores of participants, both entire test sets and core vocabulary sets, can be found in Appendix 11 for the Control Group and Appendix 12 for the Treatment Group).

Figure 3 – Test scores (correct response score) on core vocabulary (70 items) for Control and Treatment Group on Tests 1, 2 and 3

	Control Group			Treatment Group		
	Sample size	correct	incorrect	Sample size	No. of correct responses (scoring 1, 2, 3)	No of incorrect responses
Test 1				N=95	4021 ⌀ 42.33 60.47%	2629 ⌀ 27.67 39.53%
Test 2				N=47	2168 ⌀ 46.13 65.9%	1122 ⌀ 23.87 34.1%
Test 3	N=28	1221 ⌀ 43.61 62.30%	739 ⌀ 26.39 37.70%	N=27	1384 ⌀ 51.26 73.23%	506 ⌀ 18.74 26.77%

A further analysis was carried out to determine the level of accuracy of answers (Figure 4).

Figure 4 – Accuracy scores of responses to test items (scores of 0, 1, 2 and 3)

Accuracy scores of responses	**Test 1 (2 months into course)**		**Test 2 (4 months into course)**		**Test 3 (11 months into course/end of course)**	
	Control Group	Treatment Group N=95	Control Group	Treatment Group N=47	Control Group N=28	Treatment Group N=27
0 completely incorrect response		2629 (score) ⦰ 27.67 39.53%		1122 ⦰ 23.87 34.1%	739 ⦰ 26.39 37.70%	506 ⦰ 18.74 26.77%
1 partly correct (2 or more mistakes in the response)		423 ⦰ 4.45 6.36%		176 ⦰ 3.74 5.35%	95 ⦰ 3.39 4.85%	101 ⦰ 3.74 5.34%
2 partly correct (1 mistake within response)		921 ⦰ 9.69 13.85%		495 ⦰ 10.53 15.05%	340 ⦰ 12.14 17.35%	287 ⦰ 10.63 15.19%
3 completely correct		2677 ⦰ 28.18 40.26%		1497 ⦰ 31.85 45.5%	786 ⦰ 28.07 40.10%	996 ⦰ 36.8 52.7%

In addition, score averages were calculated for both Control Group and Treatment Group (Figure 5).

Figure 5 - Average sum totals of 'correct' responses (scoring 1, 2 or 3) in core vocabulary

	Control Group		**Treatment Group**	
Test 1			⦰ 111.14	52.93%
Test 2			⦰ 119.18	56.75%
Test 3	⦰ 112.07	53.37%	⦰138.35	65.88%

As both Control Group and Treatment Group consisted of two independent samples, an unpaired two-sample t-test for statistical analysis was applied to the quantitative data relating to test scores. The null hypothesis for the experimental

set-up states that the probability of there being a difference between the data of the two groups is 0.

When comparing the Control Group test scores on Test 3 and Treatment Groups scores on Test 3 (taken after the same amount of study time, i.e. 11 months into the course), results indicated that the difference is statistically significant ($p \leq 0.05$) so that the performance in terms of average scores is significantly better in the Treatment Group with 65.88% than in the Control Group with 53.37%.

9.1.2 Vocabulary learning questionnaire (based on combined responses from Control and Treatment groups)

Students were surveyed on the frequency of their strategy use ('always', 'often', 'sometimes',' rarely', 'never') on the following vocabulary learning strategies:

- Guessing from context
- Bilingual dictionary use
- Writing vocabulary lists
- Keeping a notebook
- Index cards
- OU Flashcard Maker
- Grouping words
- Recording vocabulary for listening
- Diagrams and mindmaps
- 'On the move' learning

Figures 6, 7 and 8 show the frequency with which participants (N=124) use the above vocabulary learning strategies. Figure 6 indicates those strategies which are used with high frequency; Figure 7 display strategies used with medium frequency and Figure 8 presents those strategies which are used with low frequency.

Figure 6 – Vocabulary learning strategies used by students 'always' or 'often' (high frequency) (N=124)

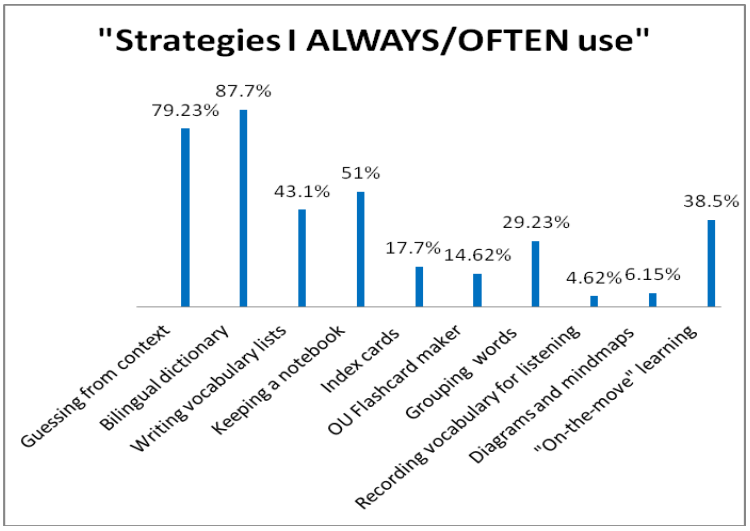


Figure 7 – Vocabulary learning strategies used by students 'sometimes' (medium frequency) (N=124)

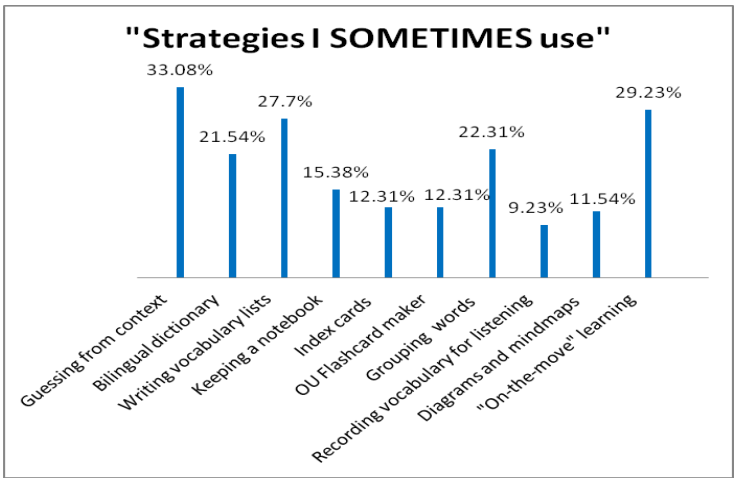
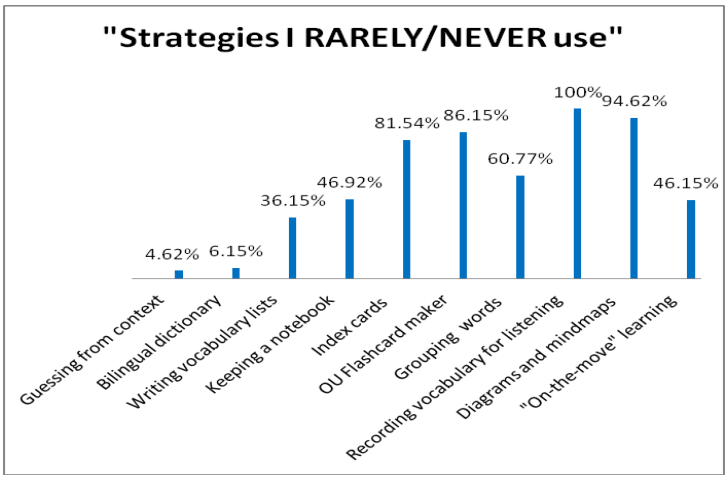


Figure 8 – Vocabulary learning strategies used by students 'rarely' or 'never' (low frequency) (N=124)



It was interesting to note that at the start of the study the majority of participants (81.54 and 86.15%) reported to either rarely or never use word card or flashcard learning strategies. As participants reported that the two most often used strategies were ‘guessing from context’ and ‘bilingual dictionary’ use, it could be speculated that students lack strategy awareness, an issue that is raised in some examples of the open-feedback. The question of why the OU Flashcard maker is amongst the least used strategies will be addressed at a later stage but for now two possibilities may be considered: the OU Flashcard tool is simply not a common one or students decide against its use on the basis of the functionality of the tool itself.

The Vocabulary Learning Questionnaire for the Control Group (28) surveyed which of their own learning strategies were used in addition to those they had not been explicitly asked about (Table 4). Due to participants’ possible misinterpretation some of the strategies overlapped with those the questionnaire listed.

Table 4 – Vocabulary learning strategies employed by Control Group (N=28)

Vocabulary Learning Strategy listed	Number of times mentioned
Reading	6
Writing	5
Word list	5
Saying out loud	5
Dictionary	2
Writing in vocabulary book	2
Exporting Quizlet lists to spreadsheets, randomising order	2
Writing and re-writing sentences	2
Listing vocabulary by theme	2
Using vocabulary in context	2
Recording on tape	1
Write-cover-write-check	1
Drawing scenes containing vocabulary	1
Listing vocabulary in blocks	1
Online dictionary	1
Highlighting in textbook	1
Vocabulary cards	1
Books	1
Revision cards	1
Annotating text	1
Self-created paper flashcards	1
Printing lists	1
Tutorials	1
Memorising in context	1
Speaking	1
Own vocabulary notes	1
Re-visiting vocabulary	1
Using course materials	1
Copying into colour-coded notebooks	1
Picture dictionary	1
Colour-coding for gender	1

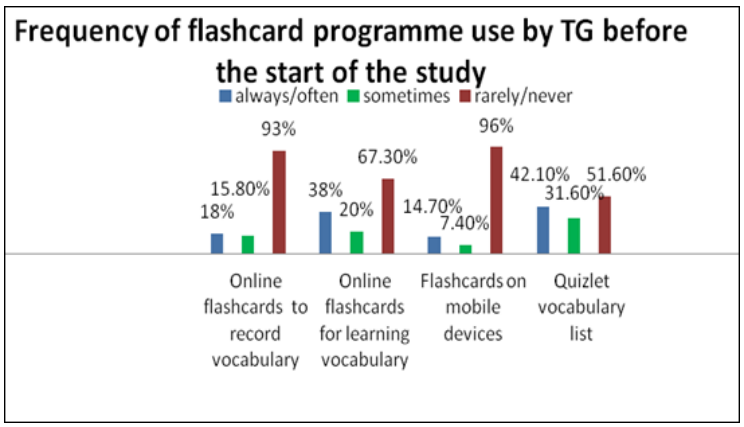
At the end of each vocabulary test, participants in the Treatment Group were surveyed on their engagement with the DVT. Only the Treatment Group received the following four statements in their survey:

- I use online flashcards (e.g. Quizlet) to learn
- I use online flashcards (e.g. Quizlet) to review vocabulary
- I use flashcards on my mobile/iPhone, iPod, iPad for learning and reviewing vocabulary
- I use the vocabulary lists from Quizlet for each *Thema (*unit) (e.g. print it out)

It is important to note here that participants were asked the question at the beginning of the study, i.e. they had just received instructions on the use of Quizlet. The questionnaire attempted to take a snapshot of which strategies were used pre-

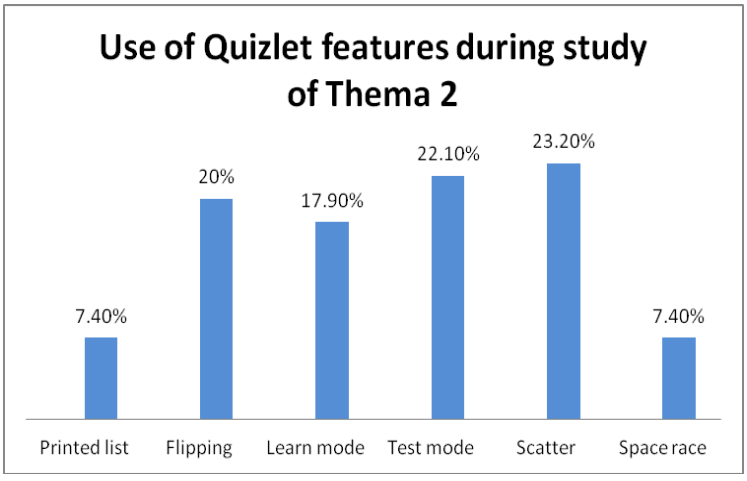
study. The majority of participants completed the questionnaire before they embarked on using Quizlet for regular learning (Figure 9).

Figure 9 – Frequency of flashcard programme use by TG before the start of the study (N=95)



As part of Test 1 participants from the Treatment Group were asked about which Quizlet features they used during study of *Thema (unit)* 2 vocabulary. In the question, participants were reminded of the different modes (Figure 10).

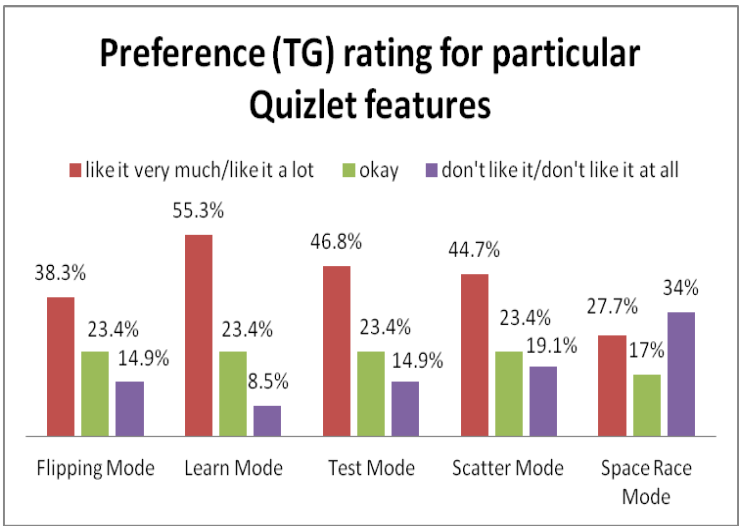
Figure 10 – Use of Quizlet features during study of *Thema* 2 by Treatment Group (N=95)



Participants from the Treatment Group were also asked about their preferences for particular learning features on Quizlet. They responded to each prompt by giving a score between 1 and 5 (5 = like it very much, 4 = like it quite a lot, 3 = okay, 2 = don't really like it, 1 = don't like it).

The figure below (Figure 11) combines the two positive scores ‘like it very much/like it a lot’, and the two negative scores ‘don’t like it/don’t like it at all’. The neutral response ‘okay’ remains on its own.

Figure 11 – Preference rating for particular Quizlet features by Treatment Group (N=95)

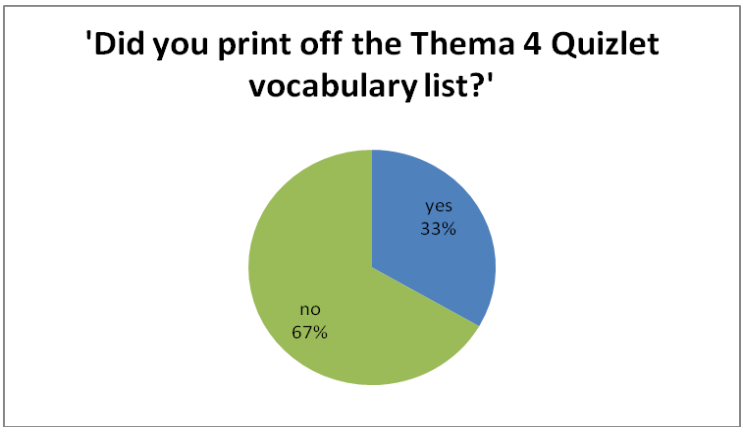


‘Learn Mode’ was reported to be the mode that was liked best by participants. In ‘Learn Mode’ learners provide written translations either from L1 to L2 or vice versa. This is followed by ‘Test Mode’ in which learners can choose a range of different test types, e.g. multiple choice, translation. ‘Scatter Mode’ was voted the next best liked mode, in which learners match L1 with L2 equivalents. ‘Space Race Mode’ fared worst and was disliked by the highest percentage of participants. Participants reported that this particular mode is diffcult to manage because it requires players to speed-type translations. For some participants this was difficult because of their typing speed and difficulty of inserting accents. The result on the preference of the ‘flipping mode’, i.e. familiarisation with L1 and L2 pairs by flipping from front to back of the virtual flashcard was unexpected. It had been assumed that the very features that makes a flashcard programme what it is would be the one that is most preferred.This was not the case for the participant group of this study. In terms of

cognitive processes, it may be speculated that the simple 'flipping' of cards might be essential yet uninspiring. It was interesting to see that 'Learn Mode' which requires either productive or receptive recall, depending on the translation direction, was most liked by participants.

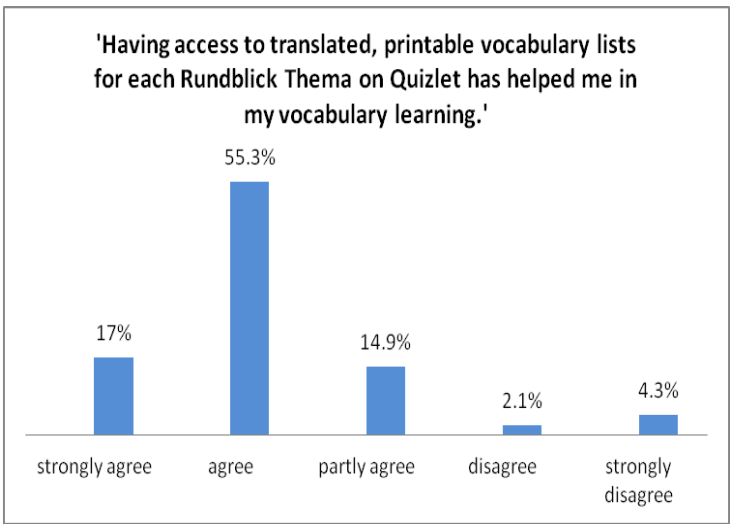
In Test 2, Treatment Group participants were asked if they had made use of the list printing feature of Quizlet. While 15 participants responded that they had printed the list, 32 participants had not done so (Figure 12).

Figure 12 – Responses to the question 'Did you print off the *Thema* 4 Quizlet vocabulary list?' presented to Treatment Group at the end of Test 2 (N=47)



Participants were also surveyed on the question of the value of having access to translated vocabulary (Figure 13). Participants were asked to indicate the degree to which they agree with the following statement: 'Having access to translated, printable vocabulary lists for each *Rundblick Thema* on Quizlet has helped me in my vocabulary learning'.

Figure 13 – Responses to the question 'Having access to translated, printable vocabulary lists for each Rundblick *Thema* on Quizlet has helped me in my vocabulary learning' presented to the Treatment Group at the end of Test 2



It is interesting to note that there seems to be a discrepancy between numbers in Figure 12 and Figure 13. While only about a third of participants printed out their vocabulary lists, when asked how much they agree that having access to translated, printable vocabulary lists has helped them with their vocabulary learning, the majority of respondents agreed or strongly agreed with the statement. Participants valued access to translated vocabulary lists but two thirds of them did not necessarily feel the need to print these out. This can be explained as a simple matter of preference, i.e. some students explained how they used lists for learning when away from the computer, while it could also suggest that participants found that having access to these lists via the flashcard programme Quizlet was sufficient.

It could also be argued that access to these lists may fulfil an emotional need in some participants to feel in control and to feel supported. The fact that translated lists are available may be reassuring and may relieve some of the pressure felt in language study.

All participants were invited to give open feedback. Test 3 consisted of the vocabulary test followed by 3 qualitative questions examining levels of engagement with the programme and any changes in study pattern. Data collected through open feedback and qualitative questions is presented in the next section.

9.2 Qualitative data

9.2.1 Open feedback

In addition to the three qualitative questions in Test 3, the TG was also asked to give open feedback at the end of Test 1 and Test 2.

Three issues emerged from the feedback:

1. Time management
2. Strategy awareness
3. Motivational effects of testing

Both in Test 1 and Test 2, many participants reported that limited or lack of time impacted on their vocabulary learning, especially as the course progressed and content became more complex (‘ I find the word order and grammar so challenging that I seem to use Quizlet less and less’).

For the analysis of qualitative data and for the identification of themes, three physical text-manipulation techniques were employed: ‘unmarked text’, ‘pawing’ and ‘cutting and sorting’. Ryan and Bernard (2003) refer to these as ‘tactile approaches for theme discovery’ and concede that theme identification is ‘one of the most fundamental tasks in qualitative research … [but] it is also one of the most mysterious’.

The technique which the authors describe as ‘unmarked text’ involves the initial examination of the text for salient features. These are usually easy to identify and can be colour-coded. The ‘pawing’ technique is similar but involves multiple reading and organisation of the text, e.g. rearranging files, categorising. The last technique ‘cutting and sorting’ is yet again a similar text-manipulation system and requires text, statements etc. to be cut out and then sorted and rearranged under headings. These three techniques were applied throughout the different phases of qualitative data analysis and aptly describe the process of theme identification used in this study.

The qualitative data derived from the first phase was scrutinised for possible themes. In subsequent phases of data collection the initial themes were further refined through the techniques allowing more in-depth text analysis.

In the process of coding the data to identify particular topics or issues, the theme of strategy awareness came through in many responses, many of them noting a lack of knowledge of how to learn vocabulary (‘*the study was interesting as it made me think of ways of learning new strategies for retaining vocabulary’*; ‘*it made me very aware of strategies that I could also incorporate into my learning of German vocabulary*’) and voiced their opinion of insufficient strategy training (‘…*we have received very little instruction on learning of vocabulary*…’).

However, while the vocabulary test in itself was not the focus of the study, a number of students commented on its motivational effect. The knowledge that a test was approaching increased the learning effort. While one participant commented that ‘*knowing that I am doing these tests is ensuring that I do make attempts to learn the vocabulary on a regular basis’,* and another one went as far as to state that they were *’looking forward to doing the next one as having to do the vocab test without*

the dictionary really made me think'. The same was echoed in comments such as '*I wouldn't have crammed so hard if there was no test*' and *'I would like a test like this every week… just like learning French by rote and drill at school*'. It appears that although time was identified as a major reason for engaging less with vocabulary learning, a degree of pressure of performing well in a test was regarded as a positive, motivational factor. But not everyone felt the same: two students responded that they found the vocabulary test '*quite frightening*' and felt that *'Quizlet highlighted what I didn't know*'. There were also comments relating to the length of the vocabulary tests and size of individual vocabulary sets on Quizlet. A number of participants felt that the test was too long, especially when taking it required sitting at the computer and typing answers. Other respondents felt that the vocabulary sets on Quizlet were too long: the set for *Rundblick Thema 2* comprised 365 items, while *Rundblick Thema 4* contained 371 items of vocabulary. However, some students viewed learning with Quizlet flashcards positively: *'I have not managed to find much Quizlet time over the past couple of months and am really feeling the impact. I find that the words I feel really SURE of are those that I have drilled into my head using Quizlet. I still remember even some of the really random words from the early chapters… even though I 've not really used them since*' and valued the difference it made to their perceived performance on the test: '*I didn't use Quizlet at all for the first test, however using it for this test has helped me considerably*'. A similar view was expressed by another student: '*As I am finding the vocabulary difficult to remember and this an area of the course I worry about the most I must say that I could not have done the course so far without the Quizlet features. In fact when starting book 2 I kept checking the OU site for the Quizlet vocabulary… it should actually be part of the course.*'

9.2.2 Questions

In Test 3 the TG was surveyed on four qualitative questions. In the following section, each question is considered in relation to data collected.

Question 1. Has the way you learn vocabulary changed over the period of this study?

Responses indicated that time remained an issue and the majority reported lack of time. For many students that meant merging their own strategy with a more limited and selected use of Quizlet *('I keep all my vocab in a book and have been learning a few pages per day. I then sometimes go onto Quizlet in "Learn Mode" and test myself in that way too*'; *'Initially I started writing my own lists as I worked through the Themen but then switched to using vocabulary lists, tests and games on Quizlet as it seemed easier to have pre-prepared lists. I also found the games and tests helpful especially with spelling*'). The latter part of the statement is confirmed by the results in accuracy levels: while 40.10% of participants in the Control Group produced wholly accurate translations in the vocabulary test, in the Treatment Group it was 52.7% of participants whose responses were completely accurate. From test to test, the accuracy level in the Treatment Group rose from 40.26% of completely accurate responses in Test 1 to 45.5% in Test 2 and finally reaching 52.7% in Test 3. A similar trend can be noted for responses only containing one mistake. At the same time, the percentage of less accurate (more than one mistake) or incorrect responses decreased. While the Control Group produced 37.7% completely inaccurate responses, this was lower in the Treatment Group with 26.77%.

It also appears that over time, study behaviour changes: students are actively trying out different strategies of coping with the large volume of new words. While simple paired-associate learning is sufficient at the beginning, as students learn more about syntax and semantics, their strategies for making sense of meaning become

more sophisticated ('*In addition, the more knowledge I accrued regarding the grammar of the German language, the easier I found it to remember*').

Question 2. As you progressed through the course, did the amount of time you spent on learning vocabulary change?

Time was the recurrent theme here as well, especially as participants observed that with increasingly challenging course content, vocabulary learning as a discrete activity was allocated less time. Instead, participants '*concentrated on grammar, listening etc.*' or spent more time on '*using them* [individual words] *in sentences'*. The last comment was echoed in other responses – vocabulary started to be learnt in context rather than as individual words.

Question 3. Did you make use of Quizlet and its features? Please explain why you did or didn't.

Yet again, time was the biggest issue for a large number of respondents. Only one participant found it '*tedious to learn lists of words, knowing that at my age they won't stick…*'. Those that used Quizlet were pleased with the programme and enjoyed games and 'Learn Mode', i.e. writing vocabulary. A number of respondents also reported printing lists and using them 'on the go'.

Question 4. If you used Quizlet: did the way you engaged with Quizlet change over time? If so, how?

Apart from the already stated fact that less time was spent on learning vocabulary in isolation, participants reported using games less. Others adjusted what the programme offered to their own needs: '*I used my hard copy of lists more for learning, which meant that I enjoyed Quizlet more (as I was getting more right)'*

(N.B. the reason for this is that when using Quizlet as a flashcard programme online

(rather than the printouts) responses to word prompts have to be in the same way as recorded on the flashcard, e.g. '*Eltern, pl*.' for 'parents'. Some respondents found that this can become irritating and annoying: although the correct translation and spelling is given, a particular part of the flashcard entry (in this case the addition of 'pl.' is missing. However, ultimately users have the option to override the 'incorrect' flag given by the programme) and '*Once I had started to use Quizlet to make and learn my own sets, I continued in the same way throughout the course*'.

9.2.3 Interviews

The interview served the purpose of drilling deeper into the way participants engaged with the flashcard programme and vocabulary learning. Three participants took part in the interviews. The interview was semi-structured with some planned questions but there was scope for the interview to develop organically.

The following questions were asked but conversations had scope to develop freely around the main themes:

- Interaction with DVT
- Attitudes towards DVTs
- Changes of study behaviour over time

Interview Questions:

- Can you describe a typical vocabulary learning session with Quizlet?
- What do you perceive to be the benefits of using Quizlet over other tools and strategies?
- What are its disadvantages in your opinion?
- Do you think Quizlet has made an impact on the way you approach vocabulary learning?

- Does the way you use Q change according to whether you are at the beginning of a *Thema* or at the end?
- Would you use Q for recording your own sets?

Interviewee 1

Interviewee 1 (I1) (interview transcript in Appendix 13) had firmly embraced Quizlet and flashcard learning. I1 followed a specific routine for learning vocabulary. She found Quizlet, i.e. access to translated vocabulary, essential. She reported:

> '*Because it's too much to think 'oh I've got to get the dictionary out…. but it (*Quizlet*) is so easy to use, that's the great thing about it…. and it's fun to use'…. It's the best thing ever.'*

I1 commented on how Quizlet could be used for short periods and how one can choose particular features:

> '*You can just go on for half an hour.. "oh I use Scatter or Space Race" and it makes you feel better actually*.'

Interviewee 2

While I2 appreciated the vocabulary lists, she felt that flashcard learning in general did not suit her own learning style. She didn't have much time to study or use the computer and was also reluctant to spend long periods of time in front of the computer. She enjoyed the idea of vocabulary drills but reported that she abandoned Quizlet/flashcard training early on, but added that she would have appreciated having had the vocabulary as sound files, so that she could have

listened to vocabulary and learned it in the car, where she spends a considerable amount of time.

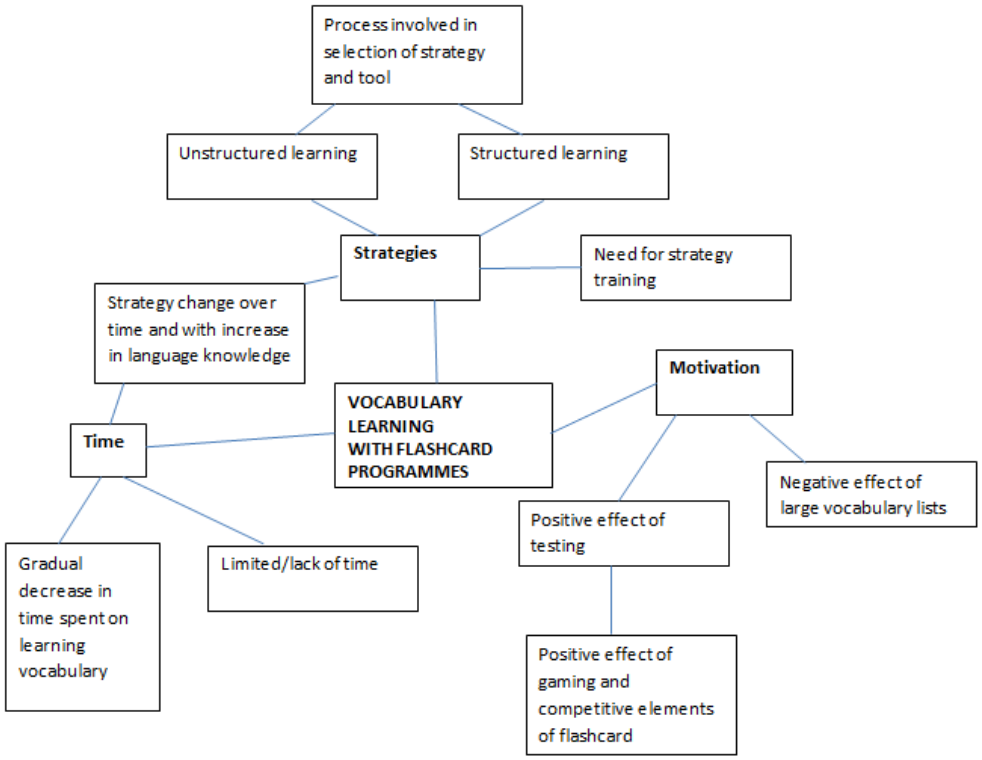
Interviewee 3

I3 described himself as a visual learner and found that he learned most by printing off the vocabulary lists, taking the lists with him and learning wherever he could. As a trained actor, he found learning from word lists less of a problem but did report that as the course progressed, less time was spent on vocabulary learning. He found that the word lists served as mini dictionaries and helped with longer reading passages, providing translations for the specific context.

An analysis of qualitative data allowed an identification of themes (Figure 14) which acted as a 'start list' (Miles and Huberman, 1994) for the interview schedule of the focus groups. Data collected from the qualitative strand of the study revealed three key themes in participants' deliberations on the use of flashcards for vocabulary learning. These related to time and time-management, learning strategies and motivation. On the theme of time, participants reported a general lack of time for studying and in particular vocabulary studying and any time spent on the activity decreased gradually. Time also affected strategy use: participants reported changes in their learning strategies over the course of time. Participants' strategies involved either structured or unstructured learning but participants showed some awareness of processes involved in their decisions on learning. They also realised that some of their strategies did not appear to be as effective as they had wished for. Some participants reported a need for more training on effective strategy use. Participants reported that the use of flashcards but also the testing schedule itself had made an impact on motivation. For some the large volume of vocabulary contained in the flashcard sets was demotivating. Other participants felt positively

motivated by the prospect of being tested. There were also reports of the positive effects of the flashcard programme Quizlet, in particular the use of gaming and competitive elements to sustain motivation.

Figure 14 – Emerging themes from analysis of qualitative data originating from open feedback and qualitative questions in Phase 2



The themes that emerged from an analysis of data, were explored in more depth in the focus group interviews.

9.2.4 Focus Groups

Responses to the individual questions were transcribed and scrutinised for common themes. In the following section, I will report on general findings and on responses for each question.

9.2.4.1 Languages and levels studied

The 10 participants studied a language either at beginners' or intermediate level in German, French and Chinese (Table 5):

Table 5 – Representation of language and levels in focus groups

	Beginners' French	Beginners' German	Beginners' Chinese	Lower Intermediate French	Lower Intermediate German
No. of students	3	4	1	1	1
Student Identities	(S2, S5, S6)	(S1, S4, S8, S10)	(S3)	S7	S9

DVTs used

Participants reported the use of the following DVTs:

i. Pure DVTs, i.e. mainly flashcards, which reinforce the memory link between L1 and L2 (Figures 15 & 16):

Figure 15 - Open University Flashcard Maker (accessible via Language Course website)

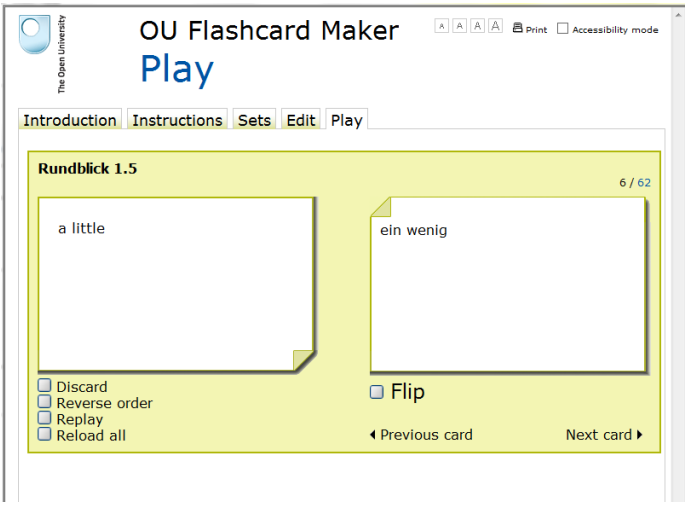
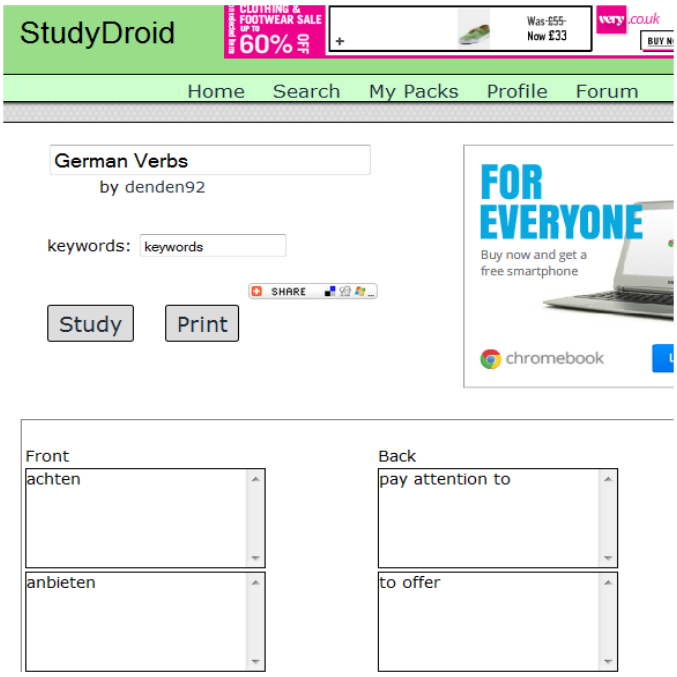


Figure 16 - StudyDroid: http://studydroid.com/index.php

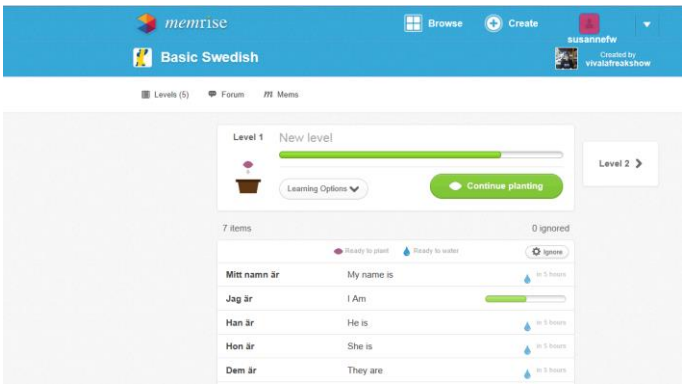


ii. DVTs, with a collection of online interactive activities, ranging from simple card 'flipping' to computer-generated multiple choice tests. Sets are user-generated and sets can be made available to everyone or shared privately. The OU Course L197 Beginners' Chinese has vocabulary sets which tie in with the course uploaded on Quizlet (Figure 17):

Figure 17 - Quizlet: http://quizlet.com/

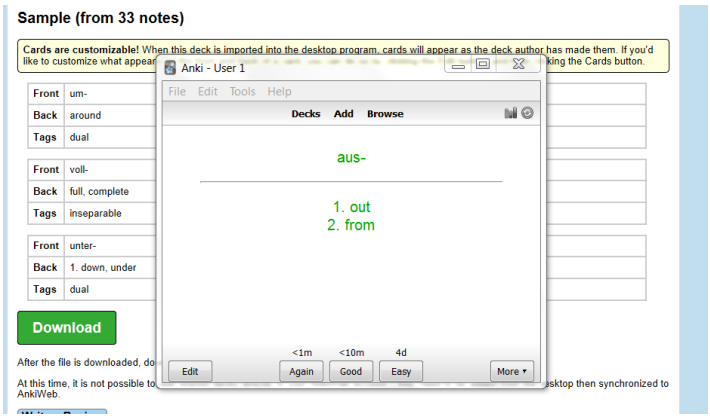
iii. A DVT, based on research in neuroscience, harnessing mnemonic strategies, audio and visual support to strengthen the memory link between L1 and L2 words (Figure 18):

Figure 18 - Memrise: http://www.memrise.com/



iv. A DVT, based on spaced repetition and active recall, i.e. presenting items at different frequency rates depending on whether a review of the learned item was successful or not and spreading the review periods over longer periods of time, forcing memory to create stronger and more effective memory traces to retrieve vocabulary (Figure 19):

Figure 19 - Anki: http://ankisrs.net/ (Anki companion web version to the computer version: https://ankiweb.net/)

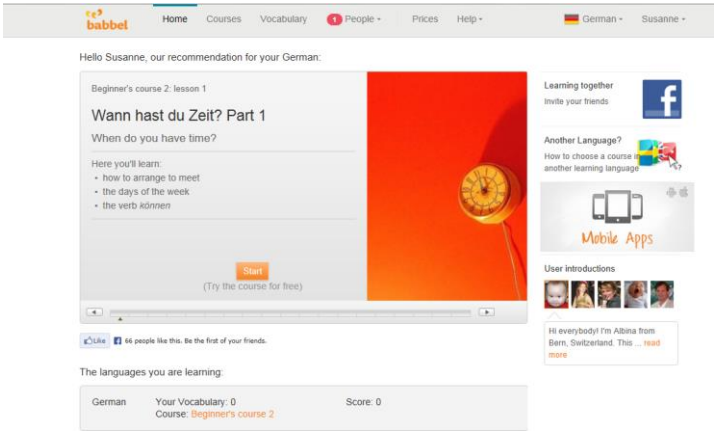


v. A DVT which is mainly used for pronunciation training, but also drills Chinese characters, Pinyin and English meaning. Words are pronounced and tones are visually presented. The recording facility allows learners to record their pronunciation of the word and visually represents their attempts for comparison with the model. Learners also receive instant feedback on their pronunciation. *New Pepper* (for Chinese) is a tone analysis programme produced by AISpeech Ltd which is not generally available to individual learners, but is usually integrated within a wider system. The programme is available to Open University students of Chinese (L197) via a download (Figure 20):

Figure 20 – New Pepper: http://www.aispeech.com/technology_product/tone_analysis.html

vi. DVTs which are part of **only commercially** available language courses (Figure 21). Although distributed commercially, Babbel offers a free trial. One participant's responses are based on their experience with the free trial.

Figure 21 - Babbel: http://www.babbel.com/homepage



Rosetta Stone is a complete language course and is only commercially available. One student had purchased the course through her company's language learning programme (Figure 22):

Figure 22 - Rosetta Stone: http://www.rosettastone.co.uk/

Before presenting participants' responses in relation to the questions discussed in the focus group meetings, it will be considered what led to the formulation of these questions.

9.2.4.2 Rationale for guiding questions used in Focus Groups

Data from previous collection phases showed that students feel generally motivated when they use DVTs even when they have no tangible evidence of improved performance. This led to further questions about student engagement with DVTs and how students perceive impact on performance and motivation. Therefore, Phase 4 set out to find answers to the Focus Group questions below which are linked to the overall Research Questions (RQ):

RQ 1: To what extent does performance on L1-L2 vocabulary tests vary when a DVT is used for vocabulary learning?

> ***Focus Group Question 2****:* How do you feel using electronic vocabulary learning programmes has impacted on your performance?
>
> ***Rationale:***
>
> While Phase 1 provided quantitative data indicating differences between DVT-users and non-users, Focus Group Question 2 is designed to investigate whether performance and students' perception of impact on performance match.

RQ 2: What are the perceived effects of DVTs on performance in vocabulary learning?

Focus Group Question 4: What do you perceive to be the advantages of learning vocabulary with the aid of electronic vocabulary learning programmes?

Focus Group Question 3*:* What effect do vocabulary training programmes have on your motivation?

Rationale (Q 3 & 4)

In a study by Stickler and Hampel (2007) the authors surveyed a group of students on their competence in a computer-mediated communication environment using Spitzberg's (2006) questionnaire. Results indicated that self-evaluated levels of motivation and knowledge on pre- and post-treatment questionnaires fluctuated. The focus of the interview question is whether participants who rate their tool skills highly also self-report positive effects on motivation and performance.

It will therefore be interesting to explore whether students who feel more comfortable with the technology of DVTs also report more positive effects on their motivation or whether difficulties with technology can influence the learning process.

Focus Group Question 5*:* What do you perceive to be the disadvantages of learning vocabulary with the aid of electronic vocabulary learning programmes?

Rationale

In Test 2 of the study, participants rated the different types of tasks (e.g. spelling, game, seeing the paired associates together, multiple choice tests

etc.) and functions of the tool. Which criteria do participants report as being attractive features which encourage engagement with the tool? Is there any variation in type of learner or do mature students generally dislike gaming simulations in the context of vocabulary learning?

RQ 3: How do mature students in a distance learning context use DVTs?

Focus Group Question 7: Has the way in which you engage with electronic vocabulary trainers changed over time? Are there differences in use of flashcards programmes for vocabulary learning in different languages and at different levels?

Rationale (Q7)

Data from previous stages of the study suggest that at beginners' level students start out motivated, engaging with flashcards more actively than further into their studies. Time has been mentioned as a reason for this. The focus group allowed access to a number of learners of different languages and different levels. This offered an insight into how students' use of vocabulary programmes changes as they become more proficient.

Focus Group Question 8: Are there any particular tasks which require different strategies than those offered by electronic vocabulary learning programmes, i.e. what other learning strategies do you use for vocabulary learning?

Rationale

Some learners had reported the use of other strategies in combination with DVTs or instead of DVTs. It appeared that some learners considered

particular vocabulary learning components were more effectively addressed by other strategies or use of additional strategies.

RQ4: To what extent do DVT affect users' learning motivation?

Focus Group Question 1: What are the reasons and motivations for opting for electronic vocabulary training programmes for vocabulary learning?

Rationale

Motivation is a factor that affects all aspects of learning. Tseng and Schmitt (2008) discuss motivation in the context of vocabulary learning and conclude that 'motivation is multidimensional in nature but also that it rarely remains constant in practice, instead going through a number of interconnected processes in terms of initiating, maintaining, and reflecting upon acts of learning in a task' (p.359). Motivation generally fluctuates (Dörnyei, 2000; Ushioda, 2001) and the initial motivation displayed by beginning students is difficult to sustain over time and generally decreases (Dörnyei and Csizér, 2002; Gardner *et al.* 2004). In order to counteract the decline of motivation while pursuing the meeting of goals, students must make a sufficient time investment to maintain their motivation (Williams and Burden, 1997).

Focus Group Question 3*:* What effect do vocabulary training programmes have on your motivation?

Rationale:

Data elicited in Phase 1 and 2 of the study would suggest that DVTs are considered to be motivating. The question aims to delve further to establish what makes DVTs motivating and what the effect of this may be.

RQ5: How do students view access to preloaded course-specific vocabulary sets?

> ***Focus Group Question 6****:* What selection criteria are applied when choosing one programme over another?
>
> ***Rationale:***
>
> Anecdotal evidence gained from the teaching context suggests that a large number of students were using DVTs. How did learners choose which DVT would suit their needs? In particular, what are learners' opinions about the content of DVTs?

In the following section, data collected in the focus groups will be presented under each of the questions addressed in the meetings of the focus groups.

9.2.4.3 Responses to questions

Question 1 – reasons and motivations for using DVTs

Question 1 yielded a substantial amount of data but there were four main, recurrent themes that emerged from participants' responses:

1. DVT-specific features

- Technical capabilities
- Ease of access and mobility
- Cost

2. Strategic learning (cognitive/meta-cognitive strategies)

- Underlying theoretical framework
- Management of learning
- Time management
- Multimodal learning
- Self-Testing
- Bite-sized learning

3. Content creation

4. Effect on motivation

In the following section, each of the themes will be examined in terms of participant perceptions.

1. DVT-specific features

Technical capabilities: Students reported that the particular technical capabilities of DVTs were an important factor in the decision making process. Some students contrasted the DVT approach with the more traditional ways of learning vocabulary, for example using a notebook. Students noted that the disadvantage of learning with notebooks is that they can get lost and tend to show signs of wear easily and that it is '*not a particularly pleasant experience'* (S6). The student concludes that *'if you use a electronic flashcard tool, then it got a good presentation, it's easy to use'.* Examining the content of these notebooks it was also noted that using this particular strategy is not ideal because the order of words rather than the word pair itself is remembered ('*You don't really remember the word but what should come next')* (S7).

Ease of access and mobility: While in general the ease of use was flagged as a positive, some students were keen on simple but not simplistic programmes, while others preferred a basic DVT. Opinions on the OU's own 'flashcard maker' were divided: while respondent S7 found that it was '*a bit simplistic',* another student liked the *'basic'* and *'no frills'* design of the OU Flashcard maker: *'I like the simplicity of it…. you drop the text into the files, and then you can run it'* (S5). This was also supported by another student who included StudyDroid in his comparison:

> '*StudyDroid is very basic and perhaps like the OU [one], whereby it just presents a list of, a list of cards, and you can either flag them as known. If you know them they go to the back of the pile or unknown, so they stay at the front of the pile, so it's very simple but avoids any over-complication and technical errors'* (S6).

With a number of students using laptops or other mobile devices, such as smartphones or tablets, 'on the go', it was reported that the ease of access and mobility to DVTs via these devices was a reason for choosing this mode of vocabulary learning. Students reported that mobile use enabled them to use DVTs on the way to work ('*I can sit with my phone on the train on my way to work'* (S6)*)* especially when mobile devices had a dual use, i.e. work and *private ('I take my laptop around with me for work a lot').* Equally, the use of these devices at home in connection with learning is regarded favourably*: 'it is just very… handy to sit in my sitting room with my laptop or iPad … and do … the vocabulary training'* (S9).

Cost: While the majority of students opted for free programmes, one participant (S2) had been using the free trial version of 'Babbel', a subscription service. Another participant reported the use of Rosetta Stone. The participant purchased the course via her multinational company who paid for it as part of her staff development. Rosetta Stone is a multimodal language course, which is usually paid for in a one-off payment. The programme offers software in form of DVDs, print materials and online activities. Vocabulary learning is only one part of the programme.

It can therefore be concluded that the majority of students interviewed opted for free programmes or trials, with only one student having the cost of the programme met by her employer.

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2. Strategic learning/cognitive/meta-cognitive strategies

Underlying theoretical framework: There is also evidence of awareness of effectiveness of learning strategies, in particular in relation to the effects of spaced-repetition systems and distributed learning, i.e. learning at spaced intervals over a long period of time, in general (*'What I like about it is the whole theory of going from short term to long term memory'* (S4)).

Management of learning: Some students reported a preference for DVTs with reviews schedules, such as is typical for spaced-repetition systems. One student liked the fact that flashcards *'stagger when a word appears again'* (S7). One of the criticisms put forward against simplistic DVTs such as the OU Flashcard Maker is that they lack adaptive training features, i.e. a personalised review schedule based on incorrect answers and self-ratings: *'If you know something very well, it doesn't reinforce it but if you can't remember it, it reinforces it more, which I would find for me another step forward'* (S5).

On the topic of self-rating of items to adapt the learning schedule, one respondent found the feature very helpful:

> *'The good thing is you rate yourself how well or easily you remember something, so 1,2,3, 4 … and that then determines when you get to see it again, so if you rate it 2, then it will be there again the next day, and if you say 4 … then it will be a week from now or something like that.'*

Self-rating is a typical activity found particularly in spaced-repetition systems where learners are required to make meta-cognitive judgements about how well they think they know a word and subsequently 'dropping' those flashcards that learners think they know well. Kornell and Bjork (2008) found that learners were often too ready to set aside items they thought they knew well; the authors considered the reason for

this to be ‘poor decision making’ and concluded that for self-regulation to be effective there needs to be ‘an understanding of how people learn’ (2008:135).

Time management: Students reported that using ready-made flashcards (i.e. flashcards compiled by others, either commercially or non-commercially, course-related and course-unrelated) is a useful time management tool. For some respondents it was simply a relief to receive an additional source of learning (**‘***it was just so nice to get ready made vocabulary’* (S2)) *for others it saved ‘so much time writing out flashcards… [time which] could be better used learning stuff’.* DVTs were considered as *‘some kind of alternative that was quick and easy’* (S2). However, it is important to note that there may be a mismatch between students’ perceptions of ‘usefulness’ and the value of particular strategies or activities based on learning theory. For example, Craik and Lockhart (1972) assert that the more a learner engages with the item to be learnt and the more the item is manipulated, the better it is learned and recalled. On the one hand it could be said that the provision of word lists bypasses a number of valuable learning opportunities; on the other hand, the more traditional strategies of vocabulary learning and reviewing are replaced by new opportunities with DVTs to interact with learning material digitally and in a number of innovative ways. This emphasises the subjectivity of learners’ evaluation of what is ‘useful’ in their learning. It may also indicate a need for more explicit strategy training in foreign language learners so that learners can make informed judgements about the effectiveness of learning techniques and strategies.

For many participants it was important that vocabulary should be learned in an organised way, rather than relying on incidental learning. Students explained that the systematic and structured approach to vocabulary learning with the help of a DVT motivated their choice.

Students recognised the need for reinforcement and repetition in vocabulary learning and felt that DVTs provide this in an optimal way:

> **'***…The best way to learn vocabulary is through repetition and also through a systematic approach. …. it is more efficient to actually have a number of words that you're reinforcing repeatedly, so that you get them into your memory as quickly as possible'* (S2).

In addition to repeated revision opportunities, one student felt **'** *that … working with electronic tools [is] easier than looking at a book because it's more structured for vocabulary learning' (S8).*

Multimodal learning: The multimodal capabilities of DVTs allow both image and audio support. This means that besides training the written L1-L2 forms, meaning formation can be supported through images and audio. Students valued in a DVT if sound or images could be added. In addition, being able to hear the word pronounced both helps learners to perfect their pronunciation and provides another channel to strengthen the L1-L2 connection in the memory.

One student who used the 'New Pepper' DVT for learning Chinese commented in particular on the usefulness of learning the pronunciation with a DVT. ('*I used New Pepper to get my tones right. I find these really useful when I use NP to show me whether I got the tones correctly and I have to keep trying'* (S3)).

'New Pepper' not only displays the translation equivalent but also pronounces the word. The programme has a function in which it records user's attempts at pronunciation which is visually matched to the model and rated. None of the other programmes have this facility but apart from the OU Flashcard Maker and StudyDroid, all programmes are audio supported, i.e. users can hear the word being pronounced.

This is a particular pronunciation feature cited by some of the participants as a reason for using DVTs:

> **'…***One of my favourite things … about Rosetta Stone which I really enjoy is the pronunciation - the fact that it corrects you. Because I think you have a problem when you are just sitting there with your books and you have an Elluminate session [online tutorial] perhaps once a month…and sometimes you get it into your head that you are pronouncing it correctly and you're not really and Rosetta Stone has this nice function of telling you when you are and when you aren't pronouncing things correctly….. there is also a speaking function on it, where it'll ask you to repeat something and it won't necessarily correct you but it will sort of like give you a tick or a cross'* (S10).

Apart from audio support, students found that being able to link words to visuals or images in some DVTs, was a good learning tool. One respondent (S2) stated that they '*enjoyed the flashcards because just seeing pictures amused [them] and it made words stick more easily'.* Another student went further when talking about the value of images in vocabulary learning when they said that '*the most powerful thing about it is the association with the image*' (S3).

Self-testing: Students' responses indicated positive attitudes towards self-testing ('…*I can sit with my phone on the train on my way to work and sort of test myself in that way'* (S6)), self-rating one's depth of knowing a word and being able to play timed games:

> '*I use Quizlet, and recently I have discovered that I could do tests on Quizlet… There is also a game which is timed and I think that is useful as well'* (S3).

Bite-sized learning: Some students commented on the fact that learning with DVTs enabled them to fit in short, 'bite-sized' chunks of learning into their daily routine without having to schedule long study sessions:

> **'***Because I take my laptop around with me for work a lot. So if I'm ever early* (for work appointments) *I can sit around and I can do 10 minutes'* (S1).
>
> '*When I wake up in the middle of the night, I can just… see if I've got 30 words … to re-water* [term used in Memrise referring to review/revision sessions*]… it is simple, you can flick it on, …" I've got two minutes…and I'll see what I've got left to do"' (S4).*

3. Content creation

Content varies from one DVT to another. Students use either commercially produced vocabulary sets on common themes or ready-made sets tying in with OU content made available on open platforms by other language learners or teachers. Some students made up their own sets.

Where students used ready-made flashcards on a variety of topics but not tying in with the course content, they commented on their enjoyment of the breadth of vocabulary offered ('*I like Memrise because I gives me… it's courses that other people have made, so it gives me a new set of words that I wouldn't necessarily find myself*' (S2)), while others tended to make up their own or export and adapt other users' sets.

Those students who create their own sets have different approaches in terms of what to include on the flashcards – apart from adding sound and image files, some students add their own mnemonic devices to help with memorisation:

(explaining how they learnt the word ‘spülen’ on Memrise): *‘So I always got it wrong, so I just drew a memory thing ‘if you don’t flush properly, you have to spoon it out’. … that’s what it’s all about: having something in your mind’.*

Other students added phrases and model sentences to demonstrate usage of the word and some find limitations on number of words and characters hindering the learning process:

‘*You drop the text into the files, and then you can run it. The only limitation…it has is in terms of the number of words or number of characters that you can put into an individual line. Because … I would have liked to … not only … use it for one word but also for phrases ‘*(S6).

‘*There is a limitation on characters but it is quite long, so I have lots of sentences, not just individual words in it… I type my sentences and my phrases and individual words into a pure notepad text file … and then import that into Anki ...’* (S7).

4. Effect on motivation

Some students referred to this type of learning as ‘fun’ and many indicated that both fun elements and rewards (‘*it won’t necessarily correct you but it will sort of like give you a tick or a cross or a kind of ‘eh eh’ voice, when you get it wrong’* (S10)*)* are motivational, which makes the learning experience, i.e. the process of learning vocabulary, which for many had been a mechanical, often uninspiring task, more attractive yet still challenging:

‘*….. What I like with the Memrise is it’s straight away putting you under a bit of pressure….it gives you a bit of incentive’* (S4).

Question 2 – perceived impact on performance

Students reported a range of perceived improvements, however, there was no hard evidence whether their perceptions are borne out in reality, e.g. none of the participants reported an improvement in grade, although this could be a result of the constraints of the environment and research method. Students used tentative language when talking about their perceptions of improvement ('noticed', 'I'd like to think…', 'probably').

Improvements mentioned can be broadly divided into:

- Improvement in pronunciation

Some participants commented on the positive impact the added audio support made on their learning:

' *I'd like to think that it has improved my performance although I'm not so sure…. my tutor did say that I was getting the tones better than before, so it does improve my performance...'* (use of New Pepper) (S3).

- Improvement/increase in vocabulary size

Those students who use DVTs with ready-made flashcards whose topics are different from the course content, reported an increased breadth of vocabulary:

'*I probably got a greater range of vocabulary because you are looking at a lot more words'* (S4).

Students also notice fewer instances of having to check words in a dictionary

'*When I come to actually read some text I don't have to stop and looking up things as much and it's just enhanced my comprehension'* (S1).

- Improvement in writing and written accuracy

As some DVTs provide tasks that require the learner to spell words, one student commented that he believes that this is useful for written work or spelling in general:

> **'***I think it helps with a lot of the written* [aspects of the course]' (S4).

- Improvement/change in learning strategies

One student reported that using ready-made flashcards on a range of topics sensitizes them when they read and study, i.e. 'dormant' vocabulary is activated when it is encountered in the course materials. Furthermore, this has a positive impact on looking up strategies:

> '*Having more vocabulary means that I don't have to stop and look up words … as often, and when I do need to look them up it's quite fun, and I do enjoy looking up words more than I did before.… you get these huge long nouns* (learning German)*, so even if it's what seems like a random word to be learning. And then I go and do my work from the OU book the next day and I think: 'Ah, that's the same as what was in the word I did yesterday … and it is quite rewarding …'* (S1).

One student also reported that having ready-made flashcards removes the need to make decisions on what to record as learnable vocabulary. This can potentially be a useful approach for students who find organising their study problematic or for students with dyslexia:

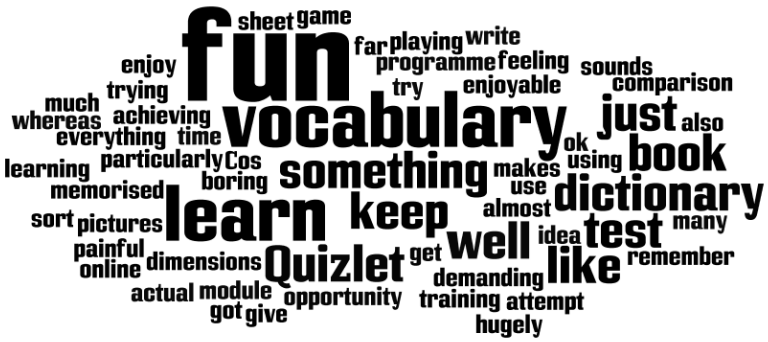
'*I can get quite confused when to take notes of all the things I need to note down and if you use a pre-programmed sort of thing, then it's all structured for you. You don't need to decide "what should I learn, what should I note down". It's all ready for you'* (S10).

Question 3 – impact on motivation

All participants reported that DVTs had a positive influence on their motivation. However, it is important to stress that all participants by default were DVTs users and therefore have a positive attitude towards these tools.

A number of intrinsic and extrinsic motivational triggers were mentioned. What all participants have in common is the initial motivation to want to master or learn vocabulary. The majority also found that this kind of learning is enjoyable – the concept of 'fun' was mentioned on a number of occasions. The transcribed responses of the focus groups were fed into the visualising tool 'wordle', creating a word cloud. The size of words represents the relative frequency in relation to other words: Figure 23 shows the word cloud, created from the transcribed responses of the participants of the focus groups.

Figure 23 – A graphic representation of frequency of terms used in participants' responses to questions discussed in the focus groups (N=10)



Respondents commented that learning vocabulary in this way is '*less of a hardship*' (S1), '*not hugely demanding*' (S2) and '*like it's playing a game as well as learning*' (S8) while having to make notes in a book and learning sections is '*very, very boring by comparison* ' (S9). In addition, confidence is boosted and a sense of achievement established (**'***it's an opportunity to do something …that does give me some feeling that I'm achieving something'* (S2)).

As DVTs work on a system of incentives, acting as motivational triggers, data from the focus group meetings was analysed in terms of students' views of the effectiveness of these features and how these impacted on their own practice.

Motivational trigger 1: Realistic targets in terms of work load and set size

One student commented that '*having a clear target for vocabulary learning is critical to motivation for me'* (S5). However, it can take some time for students to find out what is a realistic goal for their own circumstances ('*I have basically set myself targets so that I try to get 50, I started out with 100 new words a week. That was rather overambitious of me'* (S5)).

Reminders help to stay on schedule (**'***it keeps reminding you every day, to log on …' (S6)* and, in general, having a particular review schedule, which increases if targets are not met, is considered a positive prompt to study:

> *'If I go on every day, then there is less to do each day…which is motivating rather than thinking 'ah, I've done nothing all week', you know'* (S1).
>
> '*It keeps me on the straight and narrow. Anki has this staggered system that if you don't do it one day, you have twice as much to do the next day'* (S7).

Motivational trigger 2: Prompting users to engage

On the whole, students valued subtle prompts to engage with the DVT. However, one participant warned of the downside to this. When students work with too many different DVTs or vocabulary sets, the workload cannot be met and the reminders continue, then the experience can become negative:

> ’*So I think you can try too many of these* (DVTs/vocabulary sets) *and if you’ve got several going at the same time, … then it’s probably got a negative effect on your motivation because you are continually reminded by these tools to log on and do things and …can become annoying …’* (S6).

Motivational trigger 3: Provision of rewards

Students found extrinsic motivators such as badges and ticks provided by the DVT encouraging, as it provided instant feedback on performance and provided a sense of achievement:

> *‘It is motivating because I love all the tick boxes, and the little certificates and that sort of stuff’* (S2).

Motivational trigger 4: Creation of positive learning attitude

One student reported that engaging in short vocabulary training sessions, prepared them for further study:

> **‘***When I come to do something that takes more concentration, it has got me in the mood to do it’* (S2).

Question 4 - Advantages

Many of the advantages listed by the participants have already been covered in the discussion of Question 1 (reasons and motivations) and Question 3 (motivation).

Yet again, many students expressed that learning with DVTs was '**fun**':

> *'They are very helpful and because they are fun to do, then you can do … them more often, in fact I am using them probably more often than my book at the moment' (S3).*

> **'***And, so I prize vocabulary more than I used to, simply because it's been a fun activity but I think really it's helped me more than I expected'* (S2).

Students reported that DVTs help with their **time management** and learning because work is presented in small chunks and presented in a focused activity:

> '*It's a size issue, it's a sound bite thing'* (S4)

> *'I can do my vocabulary in chunks and it minimises the need for using a dictionary'* (S2)

> *'It allows you to cover a lot of ground in a concentrated manner'* (S8).

The fact that some sets are ready-made and that others made judgements about what to include in a set was seen as a positive:

> '*You've got packs that people have already generated so you don't have to re-do those'* (S6).

> '*It's the fact that the vocabulary has been organised for me, someone has selected what they think of would be useful words'* (S2)).

Just as had already been voiced in the answers to Question 1, students referred to the opportunities that DVTs provided for learning in a *'spare bit of time'.*

The fact that DVTs allow **multimodal** input is considered an advantage:

> '*It's getting the different sensory input, by listening to the pronunciation, loads of multidimensional experience…'* (S2).

In addition:

> *'You have a picture that someone else has uploaded that helps them to remember … or … a little quote … a story and you can choose from these sort of memory links, … which works for you best.'* (S1).

Participants felt that using DVTs **aids vocabulary growth**. Students acknowledged that vocabulary can be learned by using looking-up strategies but conceded that '*it interrupts the flow'* (S2) of the study session. Instead, students resort to guessing the meaning of words, rather than looking them up, which means that meaning is established more slowly. One student concluded that '*with these programmes they are decidedly expanding my vocabulary over time – in fact quite fast really'* (S2).

As in previous questions, **accessibility and *'the ease of [DVTs]'*** (S1) are regarded as an advantage:

> **S4***: 'It's the quick accessibility of it …if you've got 10 minutes on the train, … something you can do quite easily, without having to look through the book and having to decide what to do'* (S4).

Some participants also commented on the fact that by using DVTs, all learning could be in one place, therefore reducing movement between study locations and thus increasing time spent on studying:

> *I do everything on the computer …. The fact I can do this at the same time, sort of click between tabs on my computer, or do a couple of minutes of learning, a couple of minutes of doing what I want ... I think I do a lot more'* (S10).

> '*I am actually very IT literate, very online all the time, and I love that sort of ability to just do everything at my computer and not have to break off from it.'* (S8).

Question 5 - Disadvantages

Some respondents commented on the **lack of context for lexical items** and the importance of knowing when it is time to move on to the next level of learning, i.e. using the words actively in context (*'I kind of feel from time to time "right, ok, I've done enough words now and need to go and put them into sentences or read an article or something where it's solid rather than just words" '* (S1)).

While bite-sized learning is generally seen as a positive feature in the complex of process of learning, students also showed awareness of the **shortcomings of bite-sized learning** and the need to progress *('It's a soundbite, it's a small accessible thing, it's good, but does it give you enough sometimes?* (S4)).

What some students considered to be an advantage of DVTs, i.e. all learning on one device, others regarded this as being **device-bound**, and considered the portability of a book to be far more favourable.

However, the largest concerns and therefore disadvantages were voiced over the **content and quality of vocabulary sets** on different DVTs. Those sets, which are user-generated and therefore not quality-monitored, are often considered to be unreliable because of frequent mistakes (**'***There's an awful lot of mistakes in there so I really couldn't trust it'* (S7)). As an alternative, some students reported to create their own and considered it '*a personal learning curve'* (S7) because their strategy involved copying and pasting from the coursework.

Because of the issue of **unreliability** and trust issues with regards to user-generated sets available, a number of students felt that the OU courses should have ready-made vocabulary sets available as part of the course materials:

> **'***I would find it quite useful if we actually had a pack for all the courses that we were doing –…. actually it would be quite good to have a core vocab that was actually already noted ….by the OU so that you're confident …… but was actually put together as part of the package that the OU provided students that actually would be a huge advantage'* (S5).

While some students had talked about the usefulness of being exposed to vocabulary sets compiled by other students and based on their judgement of usefulness, students nevertheless felt that they are '*not always learning the words that I want'* (S3) and felt that they have *' less control over what you want to learn'* (S4). Students were in general keen to spend their time learning material that was relevant for the course:

> '…*One of the big disadvantages I think about this is, it's not relevant entirely to what I'm learning in my course book 'cos it's obviously not written by the Open University and I'm finding myself …trying to find something that matches up with something that I'm supposed to be learning as part of my*

course right now and that's quite difficult and I really wish the university would have something along with the course books' (S10).

What some students had seen as an advantage, i.e. the convenience of not having to move between computer, textbooks etc. but instead to complete all tasks at the PC, was considered by others as a disadvantage. **Being bound** to a PC (rather than having access to a mobile device) would result in less flexibility:

'*If…you only have a desktop, then I actually have to be sitting in front of the computer to do the vocabulary, the electronic vocabulary, whereas I can take a book with me anywhere and do the exercises…' (S3)*

Some respondents also reported a degree of **inflexibility in the feedback/correction system**, e.g. when the inaccuracy of the word was caused by a typing error rather than misspelling:

'*Sometimes the interpretation of whether I know the word or not is irritating… sometimes I just make a typo and then they count that as a mistake , so I have to keep going and doing it again'* (S2).

Question 6 Selection criteria

When it came to discussing specific selection criteria, it was interesting to note that all of the criteria listed had also been reported as the reasons why students utilise DVTs (Question 1). The criteria can be broadly divided into: technical, practical, cognitive/learning-strategic and motivational criteria. The table (Table 6) below lists the selection criteria mentioned by participants. Each criterion is illustrated by respondents' comments.

Table 6 – Focus Group participants' selection criteria for DVTs

Selection criteria		Respondents' Comments
Technical	**Audio support/pronunciation tool**	**S3:** *I like New Pepper because it helps me with the tones and helps me to see where I go wrong when I am pronouncing things.* **S2:** *The accents are brilliant, a range of voices.*
	Adequate complexity	**S7:** *OU system was too simplistic*
	Platform independence	**S6:** *Some of the drivers for selection is the technology you own basically …Anki and StudyDroid you can also synchronise those with your PC, so I think the technology you use can have a bearing on which tool you use. Although I would imagine quite a few of them have platform independence.*
	Download vs. online	**S6:** *It doesn't take long to do* (downloading the programme*), it's worth the effort I would say.* **S5:** *My preference would be to have it actually on my computer as opposed to be on the internet.* **S7:** *Because I might not always have internet access. So I would always prefer something that I can have on my machine rather than something that is only online.*
	Strong visual support	**S2:** *The pictures are chosen very sensitively, so they really fit the meaning.*
Practical	**Cost**	**S2:** *My main criterion was it's free. Because I've got one month's free trial that was the main reason for using Babbel.* **S1:** *I was first of all looking for something that was free,*
	Well selected vocabulary	**S2:** *The vocabulary is usually chosen quite well.*
	Ease of use	**S1**: *So I was first of all looking for something that was free, second of all something that I could do in quick and easy sessions. But also what I like is that if I want to sit and do loads, I can, I can just sit and go over and over it.* **S4:** *User-friendly.* **S6:** *It doesn't take long to do* (downloading the programme), *cos I did the programmes, it's worth the effort I would say.* **S10***: I want everything in one place… I don't want to have to switch programmes all the time.*
	Vocabulary linked to course	**S3:** *But I found that Quizlet because the Quizlet programme is related to the sessions, then, after you've done a session in the book, then you can go to the Quizlet and then test yourself and then you can always go back and do your revision, using that, so that's why I like those two.*
Meta-Cognitive	**Self-test facilities**	S3: *I like the tests because that helps me to know what I've learnt and what I remember.*
	Flexible modes of revision	**S2:** *There is a lot of choice about how you revise when you revise.*
	Variety of tasks	**S4:** *The variation you get with the Quizlet, is quite good, … if you want to type fast, Space Race is good or the drag and drop, your word recognition comes in faster.* **S10:** *I want as many options as physically possible.* **S8:** *Different ways of learning a language, a lot of different activities, ……*
Motivational	**Interesting and Motivating**	**S2:** *I don't want it to be mechanical, I want to feel that it's interesting.* **S2:** *They've got ways of motivating you.*
	Fun	**S2**: *They are fun. It makes the whole 'aura' of the languages seem positive.* **S4:** *I think it all comes down to fun and enjoyment.* **S4**: *I think the fun element is a big one, just because it is that sort of addictive game mentality really. Cos you're trying to get a green stripe instead of a yellow or the red.*

Question 7 Change over time

Only one of the participants felt that there was no particular change in the way they approached vocabulary learning. As they considered vocabulary learning as an essential and important part of language learning, they continued using their chosen DVT for this:

> '*It's just as important to use a vocabulary trainer* [at a more advanced stage] *as when you are coming to a language newly. So I don't think for me there is a difference in treating my language learning as basic and intermediate, I use the same tool for both'* (S6*).*

It appears that with growing experience in using DVTs and increasing language knowledge, the way students engage with DVTs changes. The following shift in use was noted:

- **Use of different programmes for different language levels**

It would seem that with more language proficiency, the requirements of the DVTs change proportionally. While 'Memrise' offers user-generated, ready-made flashcard courses, supported by mnemonic devices such as rhyme, visual or verbal prompts, pronunciation models and a range of word drill type activities, Anki is more obviously geared towards creating one's own flashcards (although there is a data bank of user-generated sets available). One student explained:

> '*I tend to use Memrise for … beginner German vocabulary just to … build up my initial word bank. I use Anki for any… texts in the level 2 Spanish …. I go through each chapter when I've finished and add all those words to Anki, so that they are going in, rather than just have to sit and learn them on the spot… I have just started using Memrise at the same time as well for … more advanced Spanish words, for example at the moment I am doing a*

course on words of Spanish of Arabic origin, so it's things I wouldn't necessarily find very easily myself but wouldn't actually be of a great help to a brand new beginner' (S1).

- **Increased use/experience of how the programme works**

As students become more familiar with the programmes, they also become more confident and proficient users of the programmes. They become more autonomous in their choices of what activities will be useful for their own learning. One of the students interviewed concluded:

'I think I am sort of progressing… in using these vocabulary trainers' (S3).

- **Realistic goal setting**

As students gain more language knowledge and DVT experience, their goal setting ability becomes more efficient:

'*The only thing that I have changed is when I started with the electronic ones in French I thought only 20 words a day, oh, let's do 40. I changed that very quickly by downing them' (S7).*

'*It's actually kind of studying realistic objectives … I started with trying to go for a 100 words a week and I found that 50 was a bit more comfortable…' (S5).*

- **Increased frustration with gaps in DVTs**

It is important to stress that the frustrations voiced came from students' experience with the commercially available language course 'Rosetta Stone' rather than a stand-alone DVT. However, the gaps identified by participants are aimed at their

experience of vocabulary learning without recourse to translations, i.e. vocabulary is learned with the help of images and a trial-and-error approach:

> *'There is no English and it basically associates images with words…you gradually learn the grammar but it's not in a structured way, so it's kind of useful for sort of learning vocabulary but then you struggle sometimes understanding the grammar'* (S8).
>
> '*It should seem like trial and error* (i.e. the programme 'Rosetta Stone' does not provide any English translations or any explanations) *…when it comes to something like feminine and masculine word, "meine Freundin", and things like that, you don't really know, it's just a guessing game. I found it was just trial and error, it was horrendous'* (S10).
>
> '*I didn't know why 'apples' were masculine or feminine, it didn't explain why, I know there isn't a reason why but it didn't tell me that there was no reason why but I just thought it was me making a mistake'* (S10).

- **Sustained motivation to enquire further**

Some participants mentioned how having used a DVT has encouraged them to examine vocabulary and sentences in more depth, especially the underlying grammar:

'*When I first started using it, it was more just for fun, I would just repeat what it said and that was the end of it. And when I started this course with the Open University I wanted to know more… trying to figure out the grammar, the rules behind the grammar, and that's not something that I did before'* (S10).

With time, students seem to be changing their focus to how the individual words are put together:

'*I think I look for more of the grammar because I know I need to learn'* (S8).

'*I'm interested in structure now, grammar more than just random words'* (S10).

Question 8 Use of other strategies alongside DVTs

Participants were asked what other strategies or activities they used alongside DVTs and reasons for this.

What follows is a summary of strategies students reported to be using in conjunction with DVTs:

- **Making sense of vocabulary in context – informed guesswork**

Some participants reported that they used their vocabulary knowledge gained from DVTs in connection with other available sources of information to make more informed guesses:

'I would use these programmes to get a basic knowledge and then I'll take it away and I have to piece it together myself,... using the OU materials, using dictionaries, using grammar books, …' (S1).

- **Developing metacognitive strategies to regulate learning**

However, others felt that it was also important to know when to make a decision about the importance of knowing when not to look for translations but instead to guess or use other strategies:

'I need to know when to make an educated guess, when to look a word up, when to just not bother with the meaning… and to sort of call up words when I need them. I have to make my own list, so that's a kind of different approach, or …when to just let things pass, when to ask them to stop, so those are all judgements, so they [DVTs] don't help with that kind of thing' (S2).

- **Practising interactive spoken language**

For their word knowledge to be put into practice, students felt that the only realistic way was through interaction and conversation with others. Students appear to see DVTs as an initial stepping stone to build a foundation for further growth in other skills, in particular speaking.

'I could do with a programme … that will ask you questions in Chinese and you answer them and they tell you whether you got them right or not' (S3).

'It seems to be slow to get started unless you can have a conversation with somebody and you have questions asked at you and have to respond[…]

you desperately need to speak to other people, you need group sessions and you need this kind of thing which electronic programmes don't offer, they don't ask me questions, I don't have to say sentences, just one word responding, the same with post it notes: I can say "this is bread", "this is a bed", but it's not really helping with sentences in any shape or form' (S10).

The comments below do not specifically answer question 8. They relate to desired features of DVTs rather than strategies used in addition to or alongside DVTs

- **Having access to good pronunciation models**

Not all DVTs are audio supported, e.g. Anki, which the participant is referring to:

'I really like that because they've got native speakers pronouncing things and of course, if I make my own flashcards I don't have a native speaker there to say them for me' (S7).

9.3 Evaluation of methods

The following section focuses on an evaluation of each part of the study, beginning with the quantitative survey and then moving to an evaluation of the qualitative part.

9.3.1 Quantitative instruments and components of study design

9.3.1.1 Evaluation of DVT used for study

Quizlet was selected from a range of DVTs (v. Table 2) because it appeared sufficiently challenging, yet easy to use.

In order to make the vocabulary training programme a part of the course study routine, without impacting on students' time or making demands on students' technical abilities, the choice was made to opt for a user-friendly, web-based programme, which could be accessed by distributing the link to the flashcard set. For the basic user, nothing else was required.

Given that OU language students at beginners' level already have a considerable workload, it was considered inappropriate to make further demands on their time by introducing a spaced-repetition schedule. Opting for an SRS would have also meant choosing a downloadable programme, which did not appear feasible within the parameters of the study. The only free and good quality SRS programme was Anki, but recently AnkiWeb had been introduced, which is a web-based SRS but which is limited in its drill and review features. Therefore the web-based programme Quizlet was chosen, despite not having any rehearsal schedule.

The study was designed so that maximum exposure to vocabulary through a variety of study options could be guaranteed. The option of having access to translated word lists in printable form was considered to be an option for those learners who prefer a more traditional approach, yet making use of this particular feature of the programme. However, data indicated that only a third of participants used printed off word lists. Therefore, one of the main features for which the DVT was selected, was confirmed as of far less relevance than initially anticipated.

Although it is recognised that images help learning, not all of the vocabulary in the test corpus could have been represented by an image. None of the vocabulary uploaded received any additional images, therefore this feature was not relevant for the study design.

At the time of study design, audio support for Quizlet and other programmes was not available, so, yet again it did not play a vital part in the decision-making. However, based on anecdotal evidence from teaching practice, this new dimension is valued by the learners who can now access vocabulary, learn and practise the meaning of new terms, listen to the pronunciation and engage in activities based on aural word recognition and spelling.

The programme for the study had to allow users to upload their own sets. Therefore only a few programmes were appropriate in this respect. Quizlet was particularly attractive in this respect due to the ease of bulk uploading data. However, data shows that only very few (only two students make explicit reference to their own use of this function) participants reported using this function.

Initially, it was thought that the 'export' could be a potentially useful feature, as it enables users to engage with the vocabulary in a way that is relevant to them. Being able to export vocabulary lists as spreadsheets can encourage students to reorganise vocabulary and focus on those vocabulary items which are relevant for them. Here, too, learner engagement was weak, with only a small number of participants (2 participants reported to have used this facility) reporting to have made use of this function.

While the breadth of tasks is important, it is also essential to bear in mind the target group of participants of the study. Tasks and activities need to be engaging to adult learners. The layout of web pages needs to be uncluttered and easy to navigate. The selection of activities needs to be clear and age-appropriate, e.g. StudyStack and Quizlet are very similar but the activities within StudyStack have less developed

graphics than the games in Quizlet. The more basic visual appearance may appeal to some but may be too simplistic for others.

Because it was an important feature of the study, all vocabulary had to be presented at once in large quantity, so that those students who wished to only use the printed vocabulary lists, had access to the entire set immediately. However, that meant that those studying with the interactive flashcards had to deal with a very large corpus. In principle, this disadvantage should be alleviated by the fact that the lists can be exported and vocabulary uploaded in a way which suits each individual, meaning that the original large sets can be broken down, if necessary. Feedback proved that only little use was made of this facility.

As either downloads or setting up of accounts are necessary to make use of expanded rehearsal software, it was felt that rather than imposing a schedule, the schedule would be made up by the users.

9.3.1.2 Evaluation of vocabulary test

There was a number of confounding factors which may have influenced the results of the test and thus any conclusion must be viewed with caution. These factors included the issue of technical difficulties due to the nature of the learning environment, drop-out rates from the study and the time spent on the test.

Technical and logistical issues were encountered in the administration of the vocabulary tests. Due to the setting (i.e. distance education) in which the surveys had to take place, all instruments had to be delivered online. As all testing was undertaken ‘at a distance’, there was very little control over variables. Similar studies in which the effects of flashcards are examined usually involve face-to-face contact with students, test administration in a classroom setting and direct instruction. As far as can be established, there are no studies which have examined

the use of DVTs with participants in a distance learning setting, in which the vocabulary practice and subsequent tests were carried out solely online.

Participants were encouraged to use the translated vocabulary for learning between the tests and were instructed to take the online tests without referring to any other materials. The execution of the test series relied on participants' self-regulation and motivation. Some comments made by participants indicate that their participation deviated from the way the study was planned. Some did not use the flashcards or only used these before tests. Since the test series was not approached by all participants in the intended way, test results cannot be considered to reliably answer the research question which the tests were designed to answer. Furthermore, differences in test scores between Control Group and Treatment Group may not solely be a consequence of the use of the flashcard tool. Variables such as differences in engagement with DVT, prior lexical knowledge or whether the tests were taken without any aid could have been at play, affecting the test scores. Trends of improved performance over recurring test items could be noted but these are not reliable evidence in favour of the hypothesis that use of flashcards and access to translated vocabulary will improve performance on recall tests. As many participants used other strategies in parallel, the effect of learning with DVTs on performance could not reliably be observed. Improved scores between CG and TG can also be the result of the tests themselves. The benefit of using a mixed-method approach is that subsequent qualitative research could investigate possible causes for this in the interviews and focus groups.

When comparing the results of the CG and TG, it is also important to bear in mind that the number of participants in the CG was rather low (28) in comparison with the larger, initial TG group (95). However, it is crucial to consider the participant drop-out rate between the three tests: as already stated, the TG started with 95. By Test

2, the TG had reduced by approximately 50% (47); by Test 3 the TG reduced again by roughly 50% (27). In other words, the TG had reduced by more than two thirds by Test 3. It is difficult to accurately judge the reasons for this – some students had informed the researcher that they could not continue because of time constraints and having to focus on the requirements of the course. Students also drop out of the course altogether, which is information which would have remained unknown to the researcher. Therefore, it is impossible to determine whether the drop-out rate presented in the study was caused by the study itself, general drop-out or other external factors.

Some comments also made reference to the time spent on the task and the length of the test: some learners felt that there were too many items to be tested on in one sitting, which would suggest that test fatigue can have impacted on test scores.

In addition, it must also be considered to what extent the test per se influenced the result. This is usually referred to as the 'washback' or 'backwash' effect of testing. Alderson and Wall (1993) examine the different interpretations of the washback hypothesis proposed by a number of researchers and conclude that washback is a complex process. The authors suggest a range of test influences – a test can influence teaching and learning but it also creates motivation to succeed or avoid failure: 'Most discussions of washback tend to assume that the existence of a test brings about some change in the motivation and thus in behaviour' (Alderson and Wall, 1993:119). However, it is also recognised that the influence can be negative, for example when the test task triggers anxiety. Without further research it is difficult to determine to what extent the washback effect has influenced the results.

However, despite these confounding factors and methodological flaws in the design of the test, which resulted in the necessity of the quantitative data to be considered

with caution, inferences can be made as to the way students engage with flashcard tools.

9.3.1.3 Evaluation of vocabulary learning questionnaire (relating to quantitative data collection)

The decision to apply a semantic differential scale (always, often, sometimes, rarely, never) to the question of strategy use and frequency generated insightful data. However, to avoid varying degrees of interpretation of terms, further clarification should have been supplied, e.g. always = at every study session, often = 70-80% of study sessions etc., but even these are prone to subjective interpretations.

9.3.2 Qualitative instruments

9.3.2.1 Evaluation of open-ended questions

A number of open-ended questions related to the particular features of Quizlet. Reference to Quizlet rather than 'flashcard programme/DVT' was made in the wording of questions to avoid confusion in the participants. As the questions related to areas which can be generalised, the decision was made to use Quizlet as a representative of flashcard programmes.

An analysis of both qualitative and quantitative data shaped the design of the next phase of the study, i.e. the interviews.

9.3.2.2 Evaluation of interviews

All participants from the earlier stage of the study (TG – cohort 2 – 2012) were invited to take part in individual, single-session telephone interviews. Participants self-selected and three interviewees agreed to be contacted for a telephone interview. All three of the interviewees demonstrated very different engagement (or

non-engagement) with the DVT and offered a number of reasons for their choices. In order to ensure that all interviewees had participated to a similar degree in earlier parts of the study, the invitation to students should have been more prescriptive in its description of prerequisites for eligibility. However, while the outcomes of the interview phase had not been anticipated and intended, the data collected offered an insight into the diverse ways in which students tackle vocabulary learning, and in particular vocabulary learning with the aid of DVTs and pre-loaded, translated vocabulary.

Polkinghorne (2005) recommends that qualitative interviews should consist of a sequence of three interviews, giving both interviewee and researcher opportunity to establish rapport in the first session. Subsequent sessions would also have the benefit of allowing the interviewee to reflect on the topics discussed and thus providing richer and fuller answers. However, it was felt that increasing the number of meetings would have a detrimental effect on participation and it was therefore decided to opt for single telephone interviews.

9.3.2.3 Evaluation of Focus Group interviews

It is important to note at this stage that the students who had volunteered to participate had been using DVTs. Therefore it could be inferred that they are favourably inclined towards such learning systems and hence statements may include elements of bias. While the choice of focus group as a method of data collection is useful in encouraging interaction and brainstorming in the groups, there are also drawbacks:

- It is all too easy to assume consensus even though not every participant has voiced their views (Harding, 2013).

- Data analysis is dependent on the researcher's own interpretations of what was said.
- There is the danger of effects of 'group think', i.e. responses are motivated by a desire for conformity and harmony.
- Participants produce 'bland' data to please the researcher (Rushkoff, 2005).

Nevertheless, the data gathered in this phase of the study in respect of students' attitudes towards DVTs bears similarities with findings from the previous data collections.

9.4 Overall evaluation of research methodology

The choice of a mixed method approach served the research questions well. The combination of quantitative (questionnaire and vocabulary test generating nominal data on performance levels and strategy use) and qualitative methods (open-ended questions) employed in Phase 1 and 2 provided a good understanding of trends in differences in performance between Control Group and Treatment Group. A number of issues emerged from data collection with qualitative research instruments which led to a deeper investigation through further qualitative methods in form of interviews and focus groups. This meant that a number of key themes could be followed up further and investigated in more depth.

Conducting interviews with three of the participants of Phase 2 allowed to follow up on some of their feedback from the questionnaire and open questions following the vocabulary tests. The data collected in this phase assisted in the formulation of guiding questions for the following phase, i.e. focus group meetings. The use of

focus groups with participants from a wider group of learners facilitated collection of richer data. The advantage of this approach was that learners and their learning backgrounds and experiences were more diverse in terms of language and IT proficiency, and use of DVTs.

In summary, using a mixed method approach meant that the findings from the quantitative strand of the research design and those derived from data collection with two qualitative research instruments informed the following two phases (Phase 3: interviews and Phase 4: Focus Groups) and shaped Phase 3, i.e. the qualitative data collection through the use of interviews. These in turn informed the planning and conduct of focus group meetings.

Chapter 10 Discussion

In the first part of the discussion the results of the study will be examined by returning to the original research questions and it will be evaluated to what extent the research can provide answers. This will then be followed by a summary of the major observations made.

10.1 Relevance of findings to research questions

Research Question 1:To what extent does performance on L1-L2 vocabulary tests vary when a DVT is used for vocabulary learning?

The vocabulary test scores of the Control Group and Treatment Group revealed that there were three main variations and differences in performance:

1. Variation between performance of Control Group and Treatment Group: The TG *performed better* on Test 3, i.e. the same test as completed by the Control Group at the same point in their studies (last month of studies, i.e. after 11 months of study): while the CG achieved 62.30% of correct (meaning here that the *correct meaning* of the word was given even if these contained mistakes in terms of gender and accuracy of spelling; a response scored 0, if it did not convey the appropriate meaning) responses in the core vocabulary, the TG achieved 73.23%.

2. Variation between performance of Control Group and Treatment Group: The accuracy level of responses in the TG was *higher than* in the CG: while the CG achieved 40.10% of entirely accurate responses (i.e. not containing any spelling mistakes and appropriate meaning conveyed while

the TG reached 52.7% of full scores (3) in the test taken at the end of their studies.

3.Variation in performance of Treatment Group from test to test:
The percentage of correct responses (i.e. without any inaccuracies) increased throughout the three successive tests in the test of core vocabulary in the TG: the percentage of participants in the TG receiving a score of 3, i.e. a completely accurate response, in the vocabulary test started at 40.26%, rose to 45.5% in Test 2 and reached 52.7% in the Test 3, i.e. the test taken after course completion. In comparison, in the CG 40.10% of participants achieved a score of 3 at the comparable stage, i.e. at the end of the course.

A similar improvement could be noted in the percentage of correct meaning transfer/translation (including some inaccuracies in form): while in Test 1 participants achieved 60.47% of correct scores, this increased in Test 2 to 65.9%. A further improvement was observed in Test 3 where the percentage of correct responses rose to 73.23%.

Performance at accuracy level 3, i.e. no inaccuracies in meaning transfer/translation or spelling, showed the biggest improvement from test to test in the TG. In Test 1 respondents produced 40.26% of completely accurate responses, 45.5% in Test 2 and 52.7% in Test 3.

The score of 2 (i.e. containing one error, e.g. spelling or incorrect gender) showed a more modest increase from 13.85% in Test 1 to 15.19% in Test 3, but nevertheless evidence of improved performance.

The evidence from the study appears to support Schmitt's (1997) assertion that shallow learning strategies, i.e. strategies which involve only little manipulation or processing such as word lists, i.e. paired associates learning, are an effective way of learning, where large quantities of vocabulary have to be learned in a short period of time. Based on evidence from studies into depth of processing (Pressley *et al.* 1982*;* O'Malley and Chamot, 1990) Schmitt also concluded that shallow strategies may be more suitable for beginners, while complex ones are appropriate for advanced learners. As the 'new' generation of DVTs offers more sophisticated tasks associated with initial learning, retrieval and retention, it could be argued that vocabulary learning with DVTs is more than simply drilling the association between L1 and L2 equivalents and therefore not a 'shallow processing strategy' (Craik and Lockhart, 1972).

The difference in results between CG and TG may, of course, be explained by the fact that TG participants would have encountered the core vocabulary more often. The effects of the vocabulary tests themselves must not be underestimated and add an interesting facet to the exploration of vocabulary training. While the vocabulary tests were simply utilised as a testing tool and were not the focus of the research itself, a number of participants commented on the usefulness of having to study for a test. Roediger *et al*. (2011) explored the benefits of testing and examined a number of studies focusing on whether testing can influence the overall learning behaviour and ultimately performance. Roediger *et al.* (2011) conclude that students are more motivated to study more frequently if they are required to take regular tests. The researchers refer to Lyle and Crawford (2011) who found that students who had been tested frequently performed better than their peers in their final

assessment. Students felt the tests focused them more on what they were learning and encouraged them to study more often.

The value of frequent testing is often undervalued by practitioners as many believe that making mistakes could lead to feelings of failure and might damage learning. In a study by Potts and Shanks (2014) on the benefits of generating errors when learning, it was found that when errors are followed by corrective feedback, subsequent retrieval performance was higher. Potts and Shanks (2014) conclude that where greater effort (through testing and engaging with feedback) is made during learning, this can lead to better recall. This finding is consistent with other research mentioned by Potts and Shanks (Zaromb *et al.,* 2010).
However, it must also be borne in mind that there was some drop in participant rate: by the second test less than 50% of the original number of participants was left and only a third of the initial cohort completed the entire Phase 2 study.

The reason for this is not known – only very few participants contacted the researcher to explain their reason for dropping out. All of the reasons mentioned were time-related, i.e. not having enough time to complete the tests. In fact, some participants reported having to drop out of the course, which may also account for some loss of participants. In general, a number of beginners' students defer or withdraw from the course for a variety of reasons, time being one of the reasons. Therefore it could be concluded that the reduction in cohort size may partly be attributed to students experiencing time management difficulties in the course of their studies or even withdrawing from the course. It may also be inferred that participants who completed all of the Phase 2 study were motivated learners who would in general engage more with vocabulary learning.

As the results showed there was also an unexpected motivational effect of the tests themselves, which could have resulted in more learning and thus an increase in correct and accurate responses. The references to the motivational effects of both learning with DVTs and testing were also echoed in data from interviews and focus groups.

Research Question 2 probed how students perceived the effects the DVT had on their performance:

Research Question 2: What are the perceived effects of DVTs on performance in vocabulary learning?

Throughout the three phases of the research, participants were asked for feedback regarding their use of the DVT. In Phase 1 (Control Group, one test and qualitative feedback) and Phase 2 (Treatment Group, 3 tests and qualitative feedback) participants had not been informed of their scores in the vocabulary test at the time of feedback collection.

The analysis of qualitative data relating to the use of DVTs in distance learning, based on an analysis of open-ended questions, open feedback and interviews and focus groups revealed three recurring themes that occupied participants' discourse:

- Issues of time management
- Strategy use and awareness
- Effects on motivation.

Unlike in other learning settings, the issues of time management, learning strategies and motivation that emerged are particularly salient in distance education. As students are largely self-regulating the importance of adopting good study and organisational skills is paramount.

An overwhelming majority reported lack of time to focus on vocabulary learning. A shift in focus from vocabulary learning in the initial stages to a focus on grammar and other skills, also resulted in less time spent on discrete vocabulary learning. As participants progressed they reported a preference for more complex language processing, i.e. producing words in phrases and sentences. Some participants showed that they had developed a structured approach to vocabulary learning but other participants reported a rather unstructured approach. This was also borne out by data from the Focus Groups, where DVTs were used at more advanced stages of language learning but alongside a range of other activities. Other participants noted that the survey itself helped them in their reflection on and selection of learning strategies, a point taken up by Schmidt (1990) and Smith (1993), who advocated more explicit strategy training.

The majority of participants who continued for the entire Phase 2 study found that using a DVT aided them in their learning and retaining vocabulary better. It helped them to focus their learning more efficiently and motivated them to engage in the activity of vocabulary learning.

The effects which Phase 2 participants reported to have perceived related to determination, cognitive and meta-cognitive dimensions of vocabulary learning (Schmitt, 1997; Nation, 2001). As was seen in their comments, participants felt that DVT learning had led to more learning and retention of vocabulary, although no specific, quantifiable evidence was offered for this. Some students reported that they used flashcards or word lists in Quizlet (Phase 2) to determine the meaning of words (‘Determination’, see Table 1) and concluded that their vocabulary size had increased. Others reported on their use of flashcards for reviewing and retaining already encountered vocabulary (‘Consolidation’) and how it was felt that vocabulary

- even the more obscure words which might otherwise not have been learned - is more easily remembered when it had been drilled. When not using Quizlet for learning, some students perceived that they learned less vocabulary than when they made use of the tool. However, this could simply be explained by the fact that less time was spent on vocabulary learning in general. Furthermore, the majority of participants reported an effect on their performance in terms of strategy use (meta-cognitive): data indicated that participants observed higher awareness of processes involved in vocabulary learning and reported that this had a positive effect on their learning in general. Participants reported that through the use of Quizlet flashcards and associated exercises, they had extended their repertoire of vocabulary learning strategies. The majority of Phase 2 participants highlighted the motivational effects of learning with flashcards. Motivation was also derived from the test schedule in itself: students felt that knowing that they would be tested, resulted in greater motivation to revise vocabulary.

Similar effects were noted in Phase 3 (interviews): being aware of the tool and test, participants reported increased motivation to engage in more vocabulary learning.

Some students reported that they had noticed an improvement in pronunciation, where the DVT offered opportunities for learners to compare their own pronunciation with a model and receive feedback. Other participants perceived an increase in vocabulary size and accuracy. There was also an effect on meta-cognitive skills of participants: some of the feedback gathered seems to indicate that DVTs can support awareness of strategy use and training. DVTs also offer alternatives to traditional vocabulary learning for students with learning differences, e.g. such as dyslexia. However, as with many learning strategies, these depend on personal preferences and it is therefore difficult to make any general assumptions.

Participants (Phases 2, 3 and 4) reported that the use of DVTs was valued because of the instant feedback they receive, i.e. knowing whether they knew the word, spelt it correctly or whether and where they had made a mistake. The feedback that the majority of DVTs provide goes beyond simple 'correct' or 'incorrect' and includes prompts, praise, rewards and motivational support. Some participants in Phase 4 (Focus Groups) commented on the gamified features of some DVTs, e.g. collecting points as rewards or being given the task of caring for virtual plants by interacting with the DVT. Participants reported that the scheduling of rewards and reminders affected the process of vocabulary learning positively – participants enjoyed the vocabulary learning because it was linked to motivational feedback and rewards. The focus was less on the overall achievement in the vocabulary drills but rather on the process of learning itself. However, it is also important to note that where feedback and learning reminders become too frequent and intrusive, this can impact negatively on motivation and can become counterproductive. But this is largely dependent on the DVT and personal preferences.

Judging from the feedback received from students, those that use a DVT feel it enhances their learning experience.

Research Question 3 How do mature students in a distance learning context use DVTs?

The multiple data sources utilised in the study helped to gain a general insight into how students deal with DVTs. Before turning to the discussion of student engagement with DVTs based on data gathered and analysed, it is important to consider the difference between traditional and distance learning contexts.

Unlike other DVT related studies, in which the focus is on engagement and performance of young undergraduates, school or college students in traditional, full-time education, the present study focused on a different learning context and learner group. As far as could be established, there is no research which has investigated mature students' engagement with DVTs in distance language learning. No claim can be made that each learner group in the different settings is homogenous – the results from the study show that participants reported significantly different approaches to vocabulary learning with DVTs – which means that generalisations are unhelpful. However, a useful starting point in determining in which way the learner group is different from those featured in other studies is by looking at what makes the learning context so different:

In the distance learning context of the Open University:

- students must self-regulate their learning to a large degree, i.e. while there are assessment deadlines and study schedules, the way learning is structured is up to the individual student.
- students receive feedback on assessment task but less frequently on practice tasks such as language manipulation exercises.
- vocabulary study is not instructed as a separate skill.
- learning strategy training is provided but optional and may not be taken up by every student.
- depending on prior experience and background students may be digital immigrants, i.e. anyone who was born before digital technology existed (Prensky, 2003).

In traditional learning contexts:

- students practise vocabulary in the classroom on a regular basis or take part in vocabulary tests.
- students receive both formal and informal feedback on a range of tasks in the classroom.
- students have more frequent access to teachers.
- students have opportunities to discuss learning strategies and receive advice.

The distance learning environment with its specific demands on the self-regulation of the learner is therefore different from that of more traditional contexts. Unlike being immersed in learning in a traditional context, where peers and tutors are met on a regular basis, for the majority of time distance learners work independently (but follow a study schedule). Compared with traditional settings, there is reduced contact with tutors, either in form of face-to-face or online tutorials or through feedback received on assessed work. Feedback is therefore crucial in the development and improvement of all aspects of language skills. At the same time, maintaining motivation in distance language learning is essential to deal with the challenges of language study. The fact that feedback is instant, when using DVTs means that students can move on or review work as necessary in their own time without having to rely on the less frequent feedback from the tutor in distance education.

As distance learning today takes place in virtual online environments, making use of a range of digital technology, it also lends itself to support all aspects of language learning with appropriate digital or web tools.

Let us now return to the original question of how mature learners use DVTs.

While only a third of Phase 2 and 3 participants printed off the word lists (for vocabulary in Quizlet), the lists were available online for looking up vocabulary, should students feel the need to do so. However, 77% of Phase 2 respondents agreed or strongly agreed that 'having access to translated, printable vocabulary lists for each *Rundblick Thema* on Quizlet [...] helped [them] in [their] vocabulary learning', while 16 % partly agreed and only 7% disagreed or strongly disagreed. Unfortunately, these statements were not further explained and it is therefore unknown what the cause of the difference in opinions was. It was evident from the feedback that the printouts were usually used for learning while away from the computer. Students commented on the ease with which the lists could be taken anywhere to enable learning. Some students expressed a preference for this low-tech alternative because it made them less dependent on particular devices or internet connections.

Both from feedback from the study and anecdotal feedback, participants and students on the German beginners' course also commented that by having access to translated vocabulary, more time could be spent on learning vocabulary and following the course. Selinger (2004) points out that translated vocabulary is reassuring for students, especially for those who have a low tolerance of ambiguity. Grace's study (2000) into the effect of allowing beginning students access to L1 translation lists showed that those students who did have L1 access, scored higher on retention tests. Similar studies indicate similar results (Chun and Plass, 1996; Hulstijn, 1993; Hulstijn *et al.* 1996; Knight,1994; Lomicka, 1998).

When participants were asked about which non-DVT strategies they used, those reported to be used frequently ('always' or 'often') were the more 'conventional' methods of 'guessing', 'dictionary look-up', and 'writing word lists'. The spread of a

number of other reported strategies reflects the variety in learning styles. Data from Phases 1, 2 and 3 indicate that when students used DVTs and followed a 'structured', albeit self-regulated approach to learning in general (Sanaoui, 1995), this was accompanied by other strategy use, i.e. DVTs were not the only strategies used for vocabulary learning. However, the data collection for Phases 1, 2 and 3 took place between 2010 and 2012. Data collected from the Focus Groups in 2013 (Phase 4) indicated that fewer learning strategies are used in parallel with the use of DVTs. This means that for many learners, DVT use is replacing more traditional strategies. Some leaners still use traditional memorising techniques but increasingly, DVTs are becoming more prominent. It could therefore be argued that study habits and DVT use are rapidly changing. Future investigations into vocabulary learning techniques, i.e. examining language learners' preferences for traditional learning techniques and DVTs, may render a different picture from today. The use of DVTs has become increasingly popular and large communities of users have grown. Duolingo started in 2011 in beta version when it accumulated 300 000 potential users. It was reported that in January 2014, Duolingo had 60 million users, of which 20 million were active users (http://en.wikipedia.org/wiki/Duolingo). Quizlet reported 22 million monthly users in January 2015 (https://quizlet.com/).

Participants in Phase 2 reported that the study modes (in Quizlet) which had been used the most were the ones which required less complex processes, such as matching and multiple choice in 'Scatter' and 'Test mode'. As already referred to earlier, these lower level-processing tasks deal with receptive and productive recognition (Nakata, 2011). However, the majority of participants also reported that they liked 'Learn Mode' very much, making it the preferred learning mode. In 'Learn Mode' learners are required to provide written translations either in L1 or L2 which makes this a productive task (Nakata, 2011), requiring higher levels of processing. This could account for the increased accuracy of test items through more complex

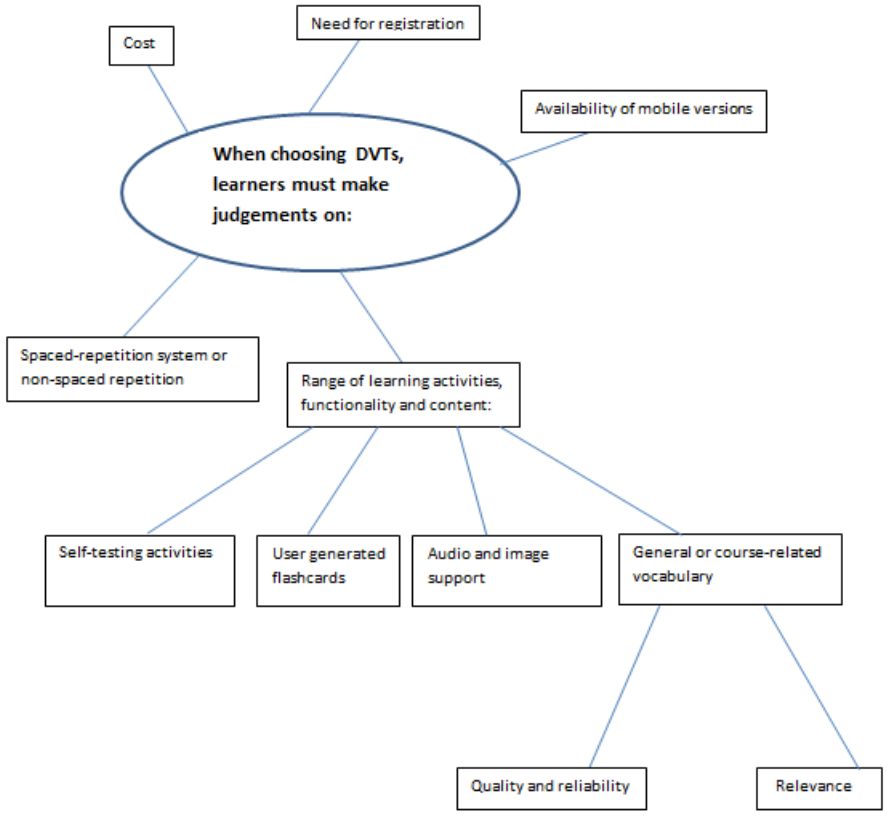
and specific training. The mode least liked involved the mechanical flipping of cards, thus memorising L1 and L2 translation equivalents. This could suggest that students engage with DVTs not purely for initial learning – if at all – but for training and maintenance purposes.

In Phase 4, i.e. in focus group interviews, participants reported that they like DVTs because they are perceived to help with the task of vocabulary learning in a systematic and structured way. Where students had worked with DVTs which tie in with the course content (Beginners' Chinese, Lower Intermediate German and in previous phases Beginners' German), i.e. where ready-made vocabulary sets are available, students found this preferable. As far as can be ascertained, there is no research comparing preference in and performance of students who have used course-related vocabulary sets as opposed to those who either compile their own or use unrelated vocabulary sets. Based on the research into depth of processing and involvement in vocabulary learning, Hulstijn and Laufer (2001) hypothesised that the more involved students are with the vocabulary learning, the more effective their learning of the material will be.This means that the use of DVTs in drill type activities increases the load and the variety of tasks, i.e. productive or receptive, and it also deepens the processing levels.

Even before learners can utilise DVTs, decisions need to be made as to which of the different DVTs may suit their learning needs and preferences. This will depend on a number of external (hardware requirements, cost implications etc.) and internal (learning style, particular learning needs) factors (Figure 24). One factor in particular was flagged up by a number of learners: where ready-made vocabulary sets were used, learners often queried the quality of the sets in terms of choice and accuracy of vocabulary. However, the majority preferred or would have preferred vocabulary

sets that tied in with the course content but some respondents explained that they found course-unrelated sets useful as they exposed them to vocabulary that would otherwise not have been learned. The data collected indicate that language beginners and novice users of DVTs tend to use DVTs receptively, i.e. flashcards are selected from already available sets, whether they are course-relevant or not. If beginning learners are novice DVT users, data suggest that there is only low-level demand on DVT capabilities. However, based on data gathered in the Focus Groups it appears that as learners become more confident in their learning strategies, the way students use DVTs becomes more complex and their engagement becomes productive. Typically this means that instead of using other users' vocabulary sets, learners will select their own vocabulary and create their own sets (where this is technically possible). More innovative approaches were reported in the Focus Group where apart from L1-L2 pairs, model sentences from the course materials were recorded on the flashcard to illustrate use of the word. It appears that the use of DVTs as a learning strategy can evolve through learners gaining more confidence in both the subject itself and the use of the DVT.

Figure 24 – Judgement process in DVT selection



Participants commented that they found DVTs useful because learning is structured, ready-made and bite-sized. This is in accord with findings from research conducted by Edge *et al.* (2012) into the benefits of using flashcards for mobile microlearning which showed that users appreciated the flexibility and chunked nature of the programme, allowing learners to make use of pockets of time throughout the day. According to the responses of participants in the present study, what gives DVTs the edge over traditional word list learning is that they are multisensory, i.e. meaning is not only established via the translation equivalents but also via images, memory prompts and audio support. In fact, this is considered to be a very useful feature to aid memorisation. Learning vocabulary in this multimodal fashion was labelled as 'fun' and 'motivating'.

The theme of motivation was the focus of the fourth research question:

Research Question 4: To what extent do DVTs affect users' learning motivation?

Based on a review of the literature and the findings from the study, it could be concluded that DVTs can have a positive effect on motivation for vocabulary learning. Many students place great importance on the learning of vocabulary, which can sometimes be disproportionate and can obscure the need for other skills development. Many students feel therefore intrinsically motivated to learn vocabulary. But there are also extrinsic motivations, such as improving performance or competition among students, which contribute to the overall motivation a student feels towards vocabulary learning. However, opportunities for receiving extrinsic rewards in distance learning are limited and therefore any external support to provide them can have a positive impact on motivation.

The majority of DVTs (apart from very basic programmes) contain many elements of gaming design. The concept of gamification has entered many sectors of education and industry and it is now believed that behaviour can be changed and learning can be improved, if motivational game mechanics such as rewards, incentives and instant feedback are utilised to encourage learning. It is recognised that play, rather than a game with formal rules, can enhance learning and development (Bell, 2005; Pomerantz and Bell, 2007). Sykes and Reihnardt (2013) who researched the use of online games in language learning noted that language play can also mean that players/learners engage in tasks that draw attention to formal aspects of language, e.g. vocabulary. Therefore it is possible to harness game elements to motivate learning. But what are the particular elements in game design that appeal to their users? What follows is a brief overview of some of the game elements used in game

design and how these influence motivation to explain possible reasons why participants repeatedly referred to the motivating qualities of DVTs.

DeHaven and Ferebee (2012) found in a study that using gamification as part of their online courses at the Kaplan University, resulted in up to 155% more engagement with the courses than without these elements. Apart from instant rewards such as points, chimes or levelling up, users received instant feedback. Kapp (2012) in *Games, Gamification and the Quest for Learning* proposes that the advantage of gamified learning over traditional learning is the frequency and intensity of the feedback. Game-enhanced, digital approaches to language learning allow for increased and immediate feedback, which is both individualised but can also reach large numbers of students. Sykes and Reinhardt (2013) stress that feedback must be provided at critical periods in the learning process and where new learning can be applied in appropriate activities. If feedback is given in a timely and appropriate manner, it is instructional rather than judgemental. Risk-taking is a crucial element in language learning but students often feel risk-averse if they think their mistakes are witnessed by others or have detrimental effects on their assessment. Game-enhanced digital learning activities offer usually unlimited attempts to turn initial failure into success. These commonly utilised 'fail states' in game design, i.e. gamification mechanisms where learners fail repeatedly (Gee, 2008), so that they have new and different learning opportunities each time they start again, allow learners to work through valuable stages in their development and construction of meaning. Sykes and Reinhardt (2013) also emphasise that feedback must be meaningful – if praise and rewards come too easily, students become disinterested but equally if it is too challenging or if students disagree with the feedback and judgement, it can also become frustrating and counterproductive. Responses from students showed that frustration arose when answers were

deemed incorrect due to a flaw in the system recognising variation, rather than an error in the answer. One of the participants in the study reported frustration when correct answers were judged as incorrect by the DVT because of alternative spelling.

A further element of game design that effects motivation, attitude to study and to progress is based on Vygotsky's (in Rieber and Wollock,1987) 'zone of proximal development' (ZPD).

The term 'zone of proximal development' refers to the process in which learning takes place through interaction with the world. It is the distance between what the learner can do on their own and what they can do with the help of others that determines the development. Sykes and Reinhardt (2013) argue that the model can be applied to gamified language learning contexts: the learner receives feedback at critical stages in the development and learning is shaped through action and reaction. The challenges must be just outside the learner's current ability to avoid boredom but must still be within feasible reach so that development can occur. When these optimal conditions are achieved, students enter the 'flow state' (Csikszentmihalyi, 1990). Flow theory originally generated much interest among gaming researchers because designing games that could engage users in such a way would ensure continued game playing. When in 'flow' state, all focus is on the task in hand and awareness of any other stimuli is reduced.

Some participants in the study reported a similar phenomenon. Many of them mentioned losing track of time during their learning sessions with the DVTs. Their description of being unaware of how much time was spent on particular activities, is an example of students entering a state of 'flow'. For a flow state to occur in the first place, though, the DVT or play opportunity must be sufficiently motivating to engage with. The interplay of intrinsic and extrinsic motivation is a state in flux; when DVTs are used to drill vocabulary, the feedback and rewards, in form of scores and

leaderboards, are extrinsic motivators but these can turn into intrinsic motivators when the activity itself becomes the motivation. A recurrent theme which emerged in a number of participants' comments referred to the motivational influence of DVTs. It also appears that the positive effect is not only limited to the area of vocabulary learning but extents to other aspects of language learning and is therefore a welcome and desirable outcome.

The practice of using gamification elements in education is becoming increasingly popular, although it is at the moment somewhat lacking academic research studies which empirically evaluate the concept, in particular with reference to DVTs. Therefore, a better understanding of how students use and interact with DVTs can contribute to a better and more effective learning design.

While there was evidence that DVTs can have a positive influence on attitudes towards vocabulary learning and motivation, how did students view the content of DVTs itself? (i.e. sets containing unchecked vocabulary, sets relating or not relating to course studies). The answer to this was the focus of the last research question:

Research Question 5: How do students view access to preloaded course-specific vocabulary sets?

Phase 2 (Treatment Group) participants were given access to preloaded course-specific vocabulary sets on Quizlet. Over three quarters of this group agreed that having access to course-specific vocabulary sets had helped them in their vocabulary learning.

The Focus Group in particular discussed the issue of the content of DVTs, i.e. should they contain only course-specific vocabulary or any vocabulary deemed to be important at a particular level. There was also concern about the relevance and reliability of accuracy of content where vocabulary sets were created by peers, i.e. fellow DVT users. Others commented on the vast choice of user-generated, non-course-related vocabulary sets but lack of relevant information as to how appropriate the selected vocabulary is in terms of skills level required. In a paper by Nesselhauf and Tschichold (2002) in which they investigated the usefulness of CALL software for English vocabulary learning, the authors recommended that any learning programme of this kind should more clearly specify the proficiency level the software targets.

While students were appreciative of all additional non-course related vocabulary sets, they were also aware of the potential problems with these. What the majority agreed upon was that having access to preloaded course-specific vocabulary sets helps with the initial, mechanical process of learning word pairs. Due to workload and time constraints, participants favoured this approach. While the literature suggests that guessing and looking up strategies are the most common, this was not supported by the evidence from the study. Students felt that using a dictionary for all of the vocabulary encountered was too time-consuming for such an intensive course. One of the interviewees explained that the sheer volume of vocabulary that she felt would need to be looked up would be too much and too tiring, resulting in feelings of being too demotivated to continue with learning. The interviewee also felt that the time gained from not having to produce their own lists and translations was time that could be spent learning vocabulary and engaging in other language learning activities.

While guessing was a strategy that participants resorted to, it was not necessarily used for establishing vocabulary growth. Guessing was simply seen as a necessity to save time. Some learners reported that when they had learned vocabulary with a DVT, they felt 'sensitized' to vocabulary through the initial exposure of the vocabulary in DVTs. When subsequently guessing was used as a strategy, the results were more accurate. Even where students did not use the DVT (e.g. Phase 3, I2) they felt that having access to course-specific, preloaded vocabulary would be beneficial to their learning, especially where this could be in flexible formats, e.g. in the form of CDs or CD-Roms to drill vocabulary. One interviewee felt that she would not have been able to finish the course without the help of preloaded vocabulary.

In summary, the research showed that learners who had taken part in Phase 2 (access to preloaded, course-specific vocabulary tests and tests on core vocabulary) performed better in recall tests in terms of transfer of meaning and accuracy than learners from the Control Group.

Learners who used a DVT perceived the following effects in relation to their performance and overall learning experience: improved pronunciation (where flashcards have audio support), larger vocabulary size, better accuracy, increased motivation, more effective focusing on learning, provision of more learning opportunities and an enhancement of learning experience.

The use of DVTs in the context of distance education is self-regulated by the learner. DVTs are often used in combination with other strategies and DVT use has become a strategy in itself. Learners' cognitive and meta-cognitive engagement with the DVT changes over time and is dependent on learners' language ability and needs and IT knowledge.

DVTs are considered to be a motivating tool, helping to stimulate learners to engage with vocabulary learning and to maintain interest. They are useful primers or starter activities before more complex learning tasks. Learners enjoy the 'bite-size' nature of typical DVT activities as it enables learners to programme short, manageable learning sessions into their daily routine.

DVTs which align with course-content are favoured as they save time, their quality is more reliable and relevant. However, learners also believe that non-course-specific flashcards can help extend learners' vocabulary.

10.2 Limitations of the study and future directions

As with all experimental, quantitative-data yielding studies, any conclusions are based on an analysis of data derived from within the limited context of the research design. Therefore, any generalisations must be considered with caution.

There is also the fundamental limitation of vocabulary research itself: is there any validity in testing vocabulary out of context? Should vocabulary be learned in L1-L2 paired associates? As the literature review outlined, the debate is ongoing but a number of researchers can see a value in testing and learning of this kind (Folse, 2004a, Schmitt, 2010, Nation, 2001).

Caution must also be exercised in the evaluation of the reliability of any qualitative data which relies on participants' opinions because ultimately any interpretation of questions or terms is highly subjective. What is also subjective is the researcher's own analysis of the data.

The limitations of the study are therefore linked to the methodological foundations and to the selection of data collection methods and instruments.

The earlier discussion of the methodology adopted for the study considered the validity of a mixed method approach. While it was argued that such an approach can generate richer data sets, it must also be conceded that the qualitative strand of the present research design may have been affected by the influence of subjectivity on the part of both the participants and the researcher.

Therefore, the limitations lie in the design of the research instruments. The research relied heavily on participants' own evaluations of usefulness of DVTs and their impact on their performance and progression. In addition, the limited size of the sample makes it problematic to formulate generalisations based on findings. However, Al-Qarni and Meara (2008), in defence of their small-sample, single subject study of vocabulary acquisition, state that 'because large-scale group studies are difficult to organise, they tend to be methodologically conservative, and are often able to look only at gross effects in vocabulary acquisition. Single case studies, on the other hand, allow us to be methodologically innovative, and to ask questions which are exploratory and risky' (2008:1). Any future qualitative research into patterns of use of DVTs may be conducted with a larger number of single case studies to gain a wider, more general idea of how learners engage with DVTs.

Using single case studies would also make it easier to ensure that any scope for differences in interpretation could be reduced through a shared understanding between researcher and participant. The qualitative data generated demonstrated that the approach was helpful in gaining insight into processes involved in learning with DVTs. However, there are a number of areas of enquiry for which data is marginal or superficial. In those cases, qualitative, introspective methods such as think-aloud protocols could shed more light on internal processes.

The present study yielded a large amount of qualitative data, although there is a lack of quantitative data to back up claims made by participants. Given the context of the study environment and the constraints of the EdD itself, any test instruments used to measure performance had to be administered remotely and online. It was important neither to add to the learners' study workload nor to take up too much of their time when it came to testing. However, any larger scale, institution-wide research study may warrant more rigorous test administration in a laboratory setting. This approach would also provide an opportunity for any pre-testing to take place to be able to fully take into account learners' previous knowledge. A controlled experimental setting would ensure more control over some of the variables. Whilst the vocabulary test used in this study generated some useful data, the reliability must be questioned due to the lack of control over a range of factors that could have affected the test.

The size of the vocabulary test may have affected the performance of some of the participants who commented on the large number of items being tested and the difficult online conditions (e.g. having to take the test in one session; some reports of difficulty inserting accents etc.). In fact, administration of a vocabulary test under laboratory conditions would have reduced a number of technical problems which participants had reported.

Research in Phases 1, 2 and 3 was concerned with basic paired associate training and testing at beginners' level, and therefore a large part of the data relates to vocabulary learning at this level. The Focus Group, i.e. Phase 4, contained a number of learners studying languages at more advanced levels and it was interesting to note that, not only did they utilise DVTs but some of them also used these in more creative ways than was the case at beginners' level. Future research

could explore how DVT capabilities could be exploited so that the training goes beyond the simple word level.

In terms of DVTs used for Phases 1 and 2 of the study, Quizlet proved to be an appropriate DVT for the task. However, the size of the uploaded vocabulary sets appeared too large and participants struggled to complete the sets during their study sessions. Gu (2003) estimates that where vocabulary is relatively easy, sets of approximately 100 items are appropriate. Any future vocabulary sets need to be manageable in size, i.e. learners should feel that they can complete a set in a realistic time frame. Ideally, course-specific vocabulary sets should accompany units of study, rather than whole blocks or chapters.

At the start of the project, it was felt that DVT applications which required registration and downloading would not be favoured by learners and could complicate the experimental set-up. However, with the growing presence of spaced-repetition based DVTs in the last few years, any future research should examine whether there is a difference in attitudes towards and use of SRS and non-SRS DVTs and whether it is possible to establish which system influences performance the most, both short-term and long-term.

Since the start of the study in 2010, the use of mobile apps on smart phones or tablets for learning has increased and a large number of students now use DVTs on mobiles or other handheld devices. Any future research into the use of apps for mobile vocabulary learning should examine in particular how learners engage with these devices and how this contributes to notions of bite-size or micro-learning.

The quantitative strand of the study focused mainly on vocabulary learning and performance of participants on a beginners' course. This is justified because a large

amount of vocabulary has to be learned when starting to learn a new language. However, the focus of a future study should be a more systematic exploration of how learners of all levels use DVTs and how learning with DVTs has become a digital learning strategy which is used in addition or instead of more traditional learning strategies. Findings of such research could form the basis for the formulation of a theoretical framework of DVT use as a learning strategy.

Results of the study indicate that learners using DVTs respond positively to the gamified design elements of DVTs. However, these findings had not been the focus of the research but a future, closer investigation into the motivational benefits of gamification in vocabulary learning could lead to a better understanding of how to harness these principles in education and in particular distance education to support and maintain motivation in a digital context.

10.3 Relevance of the study

The study examined vocabulary learning with DVTs within the specific context of mature students studying a foreign language in distance education provided by The Open University.

The study adds to the body of literature on vocabulary learning with particular reference to learning with DVTs. To date, a review of relevant literature has not uncovered a large amount of research into how language learners in distance learning environments use DVTs. With an ever-increasing number of DVTs available, the study provides an overview of the different DVTs and offers an insight into how students engage with these. At the same time a closer analysis of DVTs shows the need for further discussion on how gamification in education can be used to motivate learners. Although the concept of gamification is discussed in a number

of business and, increasingly, educational contexts, there is, as far as could be established to date, very little academic research, especially research into mature students' engagement with gaming elements in the context of vocabulary learning. It must be said, however, that while this research focused in particular on mature students in distance education, the majority of findings goes beyond the particular learner group or educational setting because the fundamental issues are rooted in the theory of learning itself.

An understanding of the role of DVTs in creating and sustaining motivation in vocabulary learning provides an insight into how teaching and learning can be optimised.

Qualitative data gathered through questionnaires, interviews and focus groups has added to a better understanding of how students approach language learning with DVTs and how decisions are made in terms of efficiency of strategies.

The data collected demonstrates that the use of DVTs has developed into a separate vocabulary learning strategy which should be utilised not only in distance education but all other educational settings. Vocabulary learning with DVTs ties in with emerging preferences for mobile learning and a 'flipped classroom' model.

The study is relevant in that it has brought together a technical overview of DVTs in terms of theoretical frameworks and technical capabilities, the learner perspective and an external evaluation of the interplay of these.

In addition, the research project has also demonstrated how a mixed method approach can generate a rich data set, exploring attitudes and perceptions of participants. The innovative approach of using web-based, online test and survey instruments and methods has demonstrated both advantages and disadvantages of procedures of this kind.

10.4 Implications for pedagogy and recommendations

The research arose from a number of comments made by students who struggled with vocabulary learning, while at the same time recognising that a good vocabulary is the foundation of successful language learning and use.

As could be seen from the responses made by learners, the use of DVTs for vocabulary learning was regarded as motivational because it was in most cases considered to be ‘fun’. Motivation plays an important part in any learning and learning context, but may be even more essential when it comes to language learning in distance education. However, it was not purely the fact that the game elements of receiving rewards and points made learning more enjoyable. Findings indicated that what learners enjoyed was the combination of realistic challenges, corrective feedback and a sense of progression that DVTs can offer as an alternative to an otherwise essential but mundane task of language learning. Therefore, if learners view particular tools and techniques as motivating, it makes sense to try to integrate these systematically into language learning.

A further aspect which motivated learners was the fact that many of the DVTs allowed for review sessions in short bursts, often outside learners’ scheduled study times, making use of whatever time learners have available. The recognition of the benefits of bite-size learning or microlearning has led to vast numbers of learning programmes designed to make use of learners’ spare time. The transformation of leisure time into study time is largely made possible through the extensive use of mobile devices in everyday life. Therefore, it follows that this trend should also be exploited for the purpose of vocabulary learning and it should be made an integral part of language learning.

This approach also ties in with the notion of the ‘flipped classroom’. Models of the flipped classroom, in which learners complete preparatory tasks before they meet in the classroom, can be applied to the specific Open University context. Such an approach acknowledges new trends in learning, makes use of new technology and uses time efficiently. By making DVT learning an integral part of the curriculum and lesson planning, more of the tutorial time can be spent on production tasks because both presentation and practice of vocabulary will have been carried out prior to the meeting.

A more integrated approach to vocabulary instruction within the course design would also mean that learners could be supplied with ready-made vocabulary sets.

The majority of students surveyed stated that they would appreciate access to translated, preloaded vocabulary sets to accompany their course. As could be seen from the results, the majority agreed that having access to translated, printable vocabulary lists helped their learning. Many participants spoke about the time-saving aspect of DVTs. This should not be the overriding factor in decisions about the use of DVTs because there is great benefit in selecting, translating and recording one’s own vocabulary. However, by providing students with already translated vocabulary to learn, the time that is gained through this can be spent on practising recall and use of the vocabulary. Supplying preloaded vocabulary sets also means that learners can be reassured about the quality of the translated vocabulary.

As could be seen in the data collected, participants felt it helped that they had access to already selected, filtered, relevant and translated vocabulary. For students with learning differences such as dyslexia the organisational aspect of deciding on which vocabulary to learn, how to record and practise it, can pose

problems. Therefore by supplying ready-made flashcard sets, vocabulary learning can become more inclusive.

The drill type activities provided by DVTs, which are also often supported by images, sound or mnemonics, allow for different types of sensory input and thus support a range of learning styles. The fact that learning material is approached from different angles through different tasks and modes supports the notion of the benefits of ‘overlearning’, i.e. learning the same material through a range of different activities and sensory channels. Opportunities for overlearning can make learning more effective, especially in cases of learners with specific learning differences such as dyslexia.

It is paramount that one must remember the specific learning context as well as the target group of learners. Many students study part-time but even those that study full-time have other commitments in addition to their studies. This means that learning strategies which would be recommended to language learners in secondary, further or higher education, may not be the most effective for mature learners and for learners in a distance learning context. Frequent exposure to the target language, vocabulary tests and using vocabulary to converse are all daily features of language lessons. Where the circumstances are different, different approaches to learning must be taken and the learner must be supported in different ways, while at the same time allowing learner autonomy and self-regulation. By providing generic strategy training for vocabulary learning and separate specific training in the implementation of DVTs for learning, students are introduced to new ways of learning.

There is another factor which makes DVTs particularly attractive in their specific setting. Where feedback on performance is limited to assessed work by the tutor in distance education, any system that can provide students with automatic correction

and feedback and at the same time offering sufficient rewards to make the entire experience motivating must be considered to be positive. The fact that a large proportion of participants considered learning vocabulary in such a way as ‘fun’ reflects the usefulness of the tool.

That is not to say that there are no drawbacks – on the contrary. The data are largely based on students who like or who have had experience with DVTs. There are many other students, who will not use DVTs, and who will find their own strategies. But what is emphasised here is that DVTs can add a new dimension, rather than completely replacing old strategies. In fact, it could be seen from the data generated in interviews and focus groups that in many ways DVTs co-exist alongside other, more traditional learning strategies. The range of drills and tasks offered by DVTs means that students engage with a variety of activities they would usually not have access to, if they relied on traditional vocabulary learning methods and followed a language course.

More sophisticated DVTs can cover the whole range of processes and strategies involved in vocabulary learning in one place. To demonstrate this it will be helpful to return to Table 1. At the determination stage, students use simple lists or L1-L2 flashcards to construct meaning. In terms of memorising vocabulary, learners make use of both sound and images where available (in particular programmes such as ‘Memrise’) to commit words to memory. At a cognitive level, students engage in a number of different ways with vocabulary, ranging from receptive and productive recognition to receptive and productive recall (see ‘Flashcard Programme Review’, Nakata, 2011). In terms of meta-cognitive skills, learners actively choose how to test themselves, create their own subset and self-rate their degree of knowledge of individual words to determine their test schedule.

To enable students to learn vocabulary more effectively and to make more efficient use of their time available, learners should receive explicit strategy training, as proposed by Schmidt (1990) and Smith (1993). The data clearly indicated that some strategies are used but not all of them most effectively or not always appropriately for the level. Sometimes students settle on one particular strategy or DVT without knowing of any other. Therefore training students in the selection and use of DVTs for vocabulary learning will ultimately make students better learners and will also promote their autonomy and self-regulation. On a practical level, this could mean that learners are introduced to the different types of DVTs available (SRS and non-SRS) and their particular features. Learners should also be instructed as to how to use DVTs at different levels in their study, e.g. using model sentences at a higher level, making their own cards instead of using ready-made cards. At this stage, the social dimension of vocabulary learning could be addressed by encouraging peer feedback and correction on students' own vocabulary sets.

Lastly, one aspect that must not be overlooked is students' enjoyment of being tested. In fact, many commented on the motivating effect of having scheduled tests. A number of DVTs allow for specific test setting (e.g. Quizlet: multiple-choice, matching etc.) which can be integrated into the course. They are relatively easy to administer but effective and motivating for the learner.

Therefore to summarise, the following recommendations are made:

- Language learners should receive strategy training for effective vocabulary learning, including both traditional, paper-based approaches and digital tools.
- Language learners in distance education should be introduced to a range of DVTs, so that they can select a DVT (or opt not to use DVTs) that suits their

learning and life-style (e.g. mobile learning versus desktop based applications).

- Language learners, in particular those on beginners' level courses, should have access to vocabulary sets on DVTs to maximise learning opportunities and encourage m-learning.
- Full use should be made of evidence from industry and the game sector, demonstrating the motivational uses of gamification, when reviewing vocabulary learning with DVTs and approaches to language learning in general.
- Intentional, i.e. planned vocabulary learning should become part of the learning schedule.
- Teachers should develop pedagogies for use of DVTs both in the classroom and outside.
- Use of DVTs and other digital tools needs a review of learning design for distance language learning, so that all components are well integrated and fully accessible and accessed by learners.

Conclusion

The initial literature review set out what notions are held about vocabulary learning and effective strategies to deal with memorisation and retrieval of lexical items. In particular research into word card and word list learning with paired-associates was reviewed as these strategies are closely related to the mechanisms used in DVTs. Only very few references to vocabulary learning with DVTs emerged from the literature review. However, a deeper analysis of the foundations and key features allowed for a closer engagement with learning psychology and in particular theories of motivation. The theoretical knowledge gained from the literature review and anecdotal evidence from practice formed the basis for the formulation of research questions. It was important that both performance and learners' perceptions of vocabulary learning with DVTs were investigated. A further review of research methodology informed the choice of a mixed method approach to gain a better understanding of tangible effects of DVTs in terms of performance and an understanding of perceptions towards and processes involved in vocabulary learning with DVTs. The data analysis revealed that using DVTs and being tested can have a positive influence on performance in terms of knowing the meaning of a word and its accurate spelling. Learners who use DVTs perceive them to be useful because ready-made sets can save time and ensure that translations are correct. The interface and functionality of the DVTs make learning with this tool motivating and fun and compel learners to engage with the DVT and learning in itself. In addition, the fact that some DVTs are available to use 'on the go' and provide manageable, small learning chunks makes this tool an attractive learning option. This in turn can have a positive influence on the learning process in general. The way learners use and engage with DVTs is not uniform and some learners make better use of the tools than others. It is therefore recommended that learners should receive training in the use of DVTs and that vocabulary training is made more

explicit. Data indicate that learners use DVTs depending on their needs and their engagement may change over time. As the mobile use of DVTs is becoming increasingly more popular and common among learners, DVTs should be considered as a learning strategy in themselves.

The research demonstrated the scope for DVTs in vocabulary learning and has also identified possible areas for future research.

Bibliography

Ahmed, M.O. (1989) 'Vocabulary Learning-Strategies', *Beyond Words,* vol. 4, pp. 3-14.

Alderson, J.C. and Wall, D. (1993) 'Does washback exist?', Applied Linguistics 14 (2), pp. 115-129.

Allum, P. (2004) 'Evaluation of CALL: Initial Vocabulary Learning', *ReCALL,* vol. 16, no. 2, pp. 488-501.

Anderson, J.P. and Jordan, A.M. (1928) 'Learning and retention of Latin words and phrases', *Journal of Educational Psychology*, vol. 19, no. 7, pp. 485-496.

Anderson, R.C. and Nagy, W. E. (1992) 'The vocabulary conundrum', *American Educator*, 16, 14-18, pp.44-47.

Ariew, R. and Frommer, J. G. (1987) ' Interaction in the computer age', *Interactive Language Teaching*, 177-193.

Armstrong, S.J. and Sadler-Smith, E.(2008) 'Learning on demand, at your own pace, in rapid bite-sized chunks: the future shape of management development?', *Academy of Management, Learning & Education*, December 1, 2008, vol. 7, no. 4, 571-586.

Atkinson, R.C. and Shiffrin, R.M. (1968) ' Human memory: A proposed system and its control
processes' in *The Psychology of Learning and Motivation*, volume 2, eds. K.W. Spence and J.T. Spence, Academic Press, New York, pp. 89-195.

Baddeley, A. (1997) *Human Memory: Theory and Practice,* East Sussex, Psychology Press.

Baddeley, A.D. (2000) ‘Short-term and working memory’, pp.77-92, in Tulving, E. and Craik, F.I.M. (eds.) (2000) *The Oxford Handbook of Memory*, New York: Oxford University Press

Bahadorfar, M. (2013) ‘The impact of computer-assisted language learning in teaching vocabulary’, *Language in India*, vol. 13, no. 1, pp. 249-257.

Bahrick, H.P. (1984) ‘Semantic memory content in permastore - 50 years of memory for Spanish learned in school’, *Journal of Experimental Psychology-General,* vol. 113, no. 1, pp. 1-29.

Bahrick, H.P. and Phelps, E. (1987) ‘Retention of Spanish vocabulary over 8 years’, *Journal Of Experimental Psychology-Learning Memory and Cognition,* vol. 13, no. 2, pp. 344-349.

Bahrick, H.P., Bahrick, L.E., Bahrick, A.S. and Bahrick, P.E. (1993) ‘Maintenance of foreign language vocabulary and the spacing effect’, *Psychological Science (Wiley-Blackwell),* vol. 4, no. 5, pp. 316-321.

Barcroft, J.(2007) ‘Effects of opportunities for word retrieval during second language vocabulary learning’, *Language Learning,* vol. 57, no. 1, pp. 35-56.

Barrow, J., Nakanishi, Y. and Ishino, H. (1999) ‘Assessing Japanese college students' vocabulary knowledge with a self-checking familiarity survey’, *System,* vol. 27, no. 2, pp. 223.

Bell, N. (2005) ‘Exploring L2 language play as an aid to SLL: a case study of humour in NS NNS interaction, ’*Applied Linguistics,* vol. 26, no. 2, pp. 192–218.

Benson, P. (2001) *Teaching and Researching Autonomy in Language Learning,* London, Pearson.

Benson, P. and Voller, P. (eds) (1997) *Autonomy and Independence in Language Learning,* London, Longman.

Bergmann, J. and Sams, A. (2014) 'Flipped learning: maximising face time', td Publications [Online] Available at: https://www.td.org/Publications/Magazines/TD/TD-Archive/2014/02/Flipped-Learning-Maximizing-Face-Time

Bloom, K.C. and Shuell, T.J. (1981) 'Effects of massed and distributed practice on the learning and retention of second-language vocabulary', *The Journal of Educational Research,* no. 4, pp. 245.

Bogaards, P.(2001) 'Lexical units and the learning of foreign language vocabulary', *Studies in Second Language Acquisition,* vol. 23, no. 3, pp. 321-343.

Bohlke, O. (2002) 'VTrain 4.0 (Vocabulary Trainer)', *CALICO JOURNAL,* vol. 21, pp. 458 469.

Bonk, C.J. and Graham, C.R (2012*) Handbook of Blended Learning*, San Francisco, John Wiley & Sons.

Burden, R.L. (1997) *Psychology for Language Teachers: A Social Constructivist Approach,* Cambridge*:* Cambridge University Press.

Burroughs, R.S. (1982) 'Vocabulary study and context, or how I learned to stop worrying about word lists'*, English Journal*, 71, 53-55.

Burston, J.(2007) 'CALICO software review: WordChamp', *CALICO Journal,* vol. 24, no. 2, pp. 473-486.

Chen, C. M., and Chung, C. J. (2008) 'Personalized mobile English vocabulary learning system based on item response theory and learning memory cycle', *Computers & Education, 51(2), 624-645.*

Chong, Y., Wong, M., and Thomson Fredrik, E. (2005) 'The impact of learning styles on the effectiveness of digital games in education', *Proceedings of the Symposium on Information Technology in Education,* KDU College, Patailing Java, Malaysia*.*

Chun, D.M. and Plass, J.L. (1996) 'Effects of multimedia annotations on vocabulary acquisition', *The Modern Language Journal,* no. 2, pp. 183.

Coady, J. and Huckin, T.N. (1997) *Second Language Vocabulary Acquisition: A Rationale for Pedagogy,* Cambridge*:* Cambridge University Press.

Cobb, T. and Stevens, V. (1996) 'A principled consideration of computers and reading in a second language' in Pennington, M.C. (ed.) *The Power of CALL*. Houston: Athelstan, pp.115-136.

Cohen, A. D. and Aphek, E. (1981) 'Easifying second language learning ', *Studies in Second Language Acquisition,* vol. 3(02), pp. 221-236.

Cohen, L., Manion, L. and Morrison, K. (2011) *Research Methods in Education,* London, Routledge Farmer.

Collins English Dictionary - Complete & Unabridged 10th Edition. Retrieved August 03, 2015, from Dictionary.com website: http://dictionary.reference.com/

Cook, L.K. and Mayer, R.E. (1983) 'Reading strategies training for meaningful learning from prose' in Pressley, M. and Levin, J. (eds) *Cognitive Strategy Research,* New York, Springer, pp. 87-131.

Craik, F I. and Lockhart, R.S. (1972) ‘Levels of processing: A framework for memory research’ *Journal of Verbal Learning and Verbal Behavior, 11(6), 671-684.*

Craik, F.I.M. and Tulving, E. (1975) ‘Depth of processing and the retention of words in episodic memory’, *Journal of Experimental Psychology: General,* vol. 104, no. 3, pp. 268 294.

Creswell, J. W., Plano Clark, V. L., Gutmann, M. L. and Hanson, W. E. (2003) ‘Advanced mixed methods research designs.’ in Tashakkori A, Teddlie C (eds) *Handbook of mixed methods in social,* pp. 209-240.

Crooks, G. and Schmidt, R. W. ‘Motivation: reopening the research agenda’, *Language Learning,* vol. 41, pp. 469-512.

Csíkszentmihályi, M. (1996) *Finding Flow: The Psychology of Engagement With Everyday Life,* New York, Basic Books.

Csizer, K. and Dörnyei, Z. (2005) ‘The internal structure of language learning motivation and its
relationship with language choice and learning effort’, *Modern Language Journal,* vol. 89, no. 1, pp. 19-36.

de la Fuente, M. (2006) ‘Classroom L2 vocabulary acquisition: investigating the role of pedagogical tasks and form-focused instruction’, *Language Teaching Research,* vol. 10, no. 3, pp. 263-295.

Dede, Chris (1996) ‘The evolution of distance education: Emerging technologies and distributed learning’, *American Journal of Distance Education* 10.2, pp. 4-36.

DeHaven, D. and Ferebee, S. (2012) 'Why gaming is working in Higher Ed' [Online]. Available at http://techonomy.com/2012/11/why-gaming-is-working-in-higher-ed/ (Accessed 1.1.2015)

Dempsey, J.V. and Sales, G.C. (eds.) (1993) *Interactive Instruction and Feedback,* Englewood Cliffs, NJ, Educational Technology Publications.

Dempster, F.N. (1987) 'Effects of variable encoding and spaced presentations on vocabulary learning', *Journal of Educational Psychology,* vol. 79, no. 2, pp. 162-170.

Donovan, J.J. and Radosevich, D.J. (1999) 'Meta-analytic review of the distribution of practice effect: now you see it, now you don't', *Journal of Applied Psychology*, vol.84, no. 5, pp. 795-805

Dörnyei, Z. (2000) 'Motivation in action: towards a process-oriented conceptualisation of student motivation', *British Journal of Educational Psychology*, vol. 70, issue 4, pp. 519-538.

Dörnyei, Z. (2001) *Teaching and Researching Motivation,* Harlow, Longman.

Dörnyei, Z. (2007) *Research Methods in Applied Linguistics,* Oxford, Oxford University Press.

Dörnyei, Z. and Csizer, K. (2002) 'Some dynamics of language attitudes and motivation: results of a longitudinal nationwide survey', *Applied Linguistics, 23,*421-462.

Dörnyei, Z. and Schmidt, R. (eds.) (2001) *Motivation and Second Language Acquisition,* Honolulu, University of Hawaii Press.

Dunkel, P. (1991) *Computer-Assisted Language Learning and Testing: Research Issues and*

Practice, The University of Michigan, Newbury House.

Ebbinghaus, H. (1885) Über das Gedächtnis: Untersuchungen zur experimentellen Psychologie, Leipzig, Duncker & Humblot. Available at: http://www.deutschestextarchiv.de/book/show/ebbinghaus_gedaechtnis_1885

Edge, D., Fitchett, S, Whitney, M. and Landay, J. (2012) 'MemReflex: adaptive flashcards for mobile microlearning', MobileHCI '12, Sept 21-24, 2012, San Francisco, CA.

Edley, N. and Litosseliti, L. (2010) 'Contemplating interviews and focus groups', in Litosseliti, L. (ed.) Research Methods in Linguistics, London, pp. 155-179.

Egbert, J. (2003) 'A study of flow theory in the foreign language classroom', *The Modern Language Journal,* vol. 87, no. 4, pp. 499-518.

Ellis, N. (1995) *The Psychology of Foreign Language Vocabulary Acquisition: Implications for Call*, Oxford, Swets Zeitlinger, BV.

Ellis, N.C. (1995) 'The psychology of foreign language vocabulary acquisition: implications for CALL', *Computer-Assisted Language Learning,* 8(2-3), 103-128.

Ellis, N. and Beaton, A. (1993) 'Factors affecting the learning of foreign language vocabulary: imagery keyword mediators and phonological short-term memory', *The Quarterly Journal of Experimental Psychology. A Human Experimental Psychology,* vol. 46, no. 3, pp. 533-558.

Ellis, R. (1990) *Instructed Second Language Acquisition,* London, Blackwell.

Ellis, R. (2008) *The Study of Second Language Acquisition,* Oxford, Oxford University Press.

Ellis, R., Tanaka, Y. and Yamazaki, A. (1994) 'Classroom interaction, comprehension, and the acquisition of L2 word meanings', *Language Learning,* vol. 44, no. 3, pp. 449-491.

Ellis, R. (1991) *The Interaction Hypothesis: A Critical Evaluation,* in Sadtono, E. (ed.) (1991) Language Acquisition and the Second/Foreign Language Classroom, Singapore, RELC.

Eubanks, P. and Abbott, C. (2003) 'Using focus groups to supplement the assessment of technical communication texts, programs, and courses', *Technical Communication Quarterly,* vol. 12, no. 1, pp. 25-45.

Fan, M.Y. (2003) 'Frequency of use, perceived usefulness, and actual usefulness of second language vocabulary strategies: A study of Hong Kong learners', *The Modern Language Journal,* vol. 87, no. 2, pp. 222-241.

Fitzpatrick, T., Al-Qarni, I. and Meara, P. (2008) 'Intensive vocabulary learning: a case study', *Language Learning Journal,* vol. 36, no. 2, pp. 239-248.

Folse, K. (2004a) 'Myths about teaching and learning second language vocabulary: what recent research says', *TESL Reporter* 37, 2, pp.1-13.

Folse, K. (2004b) 'The underestimated importance of vocabulary in the foreign language classroom', *CLEAR news,* vol. 8(2), 1.

Foster, H. (2011) 'Building learner-generated vocabulary logs with Quizlet', *The Language Teacher, 33 (12), 23-25.* Available at http://jalt-publications.org/tlt/departments/tlt-wired/articles/457-building-learner-generated-vocabulary-logs-quizlet. Accessed on 1.1.2015.

Gardner, R.C. (1985) *Social Psychology and Language Learning: the Role of Attitudes and Motivation,* London, Edward Arnold.

Gardner, R.C. (1988) 'The socio-educational model of language learning: assumptions, findings and issues', *Language Learning,* vol. 38, pp. 101--126.

Gardner, R.C. and Lambert, W.E. (1959) 'Motivational variables in second language acquisition', *Canadian Journal of Psychology,* vol. 13, pp. 266-272.

Gardner, R.C., Masgoret, A.M., Tennant, J. and Mihic, L. (2004) 'Integrative motivation: changes during a year-long intermediate-level language course', *Language Learning,* vol. 54, no. 1, pp. 1-34.

Garrett, N. (2009) 'Computer-assisted language learning trends and issues revisited: integrating innovation', *Modern Language Journal,* vol. 93, no. 1, pp. 719-740.

Gass, S. (1999) 'Discussion: incidental vocabulary learning', *Studies in Second Language Acquisition,* vol. 21, no. 2, pp. 319-333.

Gass, S.M. and Mackey, A. (2007) *Data Elicitation for Second and Foreign Language Research.* London, Routledge.

Gee, J. P. (2008) 'Learning and games', in Salen, K. (ed.) The Ecology of Games: Connecting Youth, Games, and Learning, Cambridge, MA: The MIT Press.

Glaser, B.G. and Strauss, A.L. (2009) *The Discovery of Grounded Theory: Strategies for Qualitative Research,* Transaction Publishers.

Godwin-Jones, R. (2010) '*From Memory Palaces to Spacing Algorithms: Approaches to Second-Language Vocabulary Learning*' [Online] Available at http://llt.msu.edu/vol14num2/emerging.pdf, University of Hawaii, National Foreign Language Resource Center.

Gorjian, B., Moosavinia, S.R., Kavari, K.E., Asgari, P. and Hydarei, A. (2011) 'The impact of synchronous computer-assisted language learning approaches on English as a foreign language high and low achievers' vocabulary retention and recall', *Computer Assisted Language Learning: An International Journal,* vol. 24, no.5, pp. 383-391.

Grace, C.A. (2000) 'Gender differences: vocabulary retention and access to translations for beginning language learners in CALL', *The Modern Language Journal,* no. 2, pp. 214.

Greene, J., D'Oliveira, M. (2005) *Learning to Use Statistical Tests in Psychology,* Milton Keynes*,* Open University Press.

Groot, P.J.M. (2000) 'Computer assisted second language vocabulary acquisition', *Language Learning & Technology,* vol. 4, no.1, pp. 60-81.

Gu, P.Y. (2003) 'Vocabulary learning in a second language: person, task, context and strategies', *TESL-EJ,* vol.7, no. 2.

Guilloteaux, M.J. and Dörnyei, Z. (2008) 'Motivating language learners: a classroom-oriented investigation of the effects of motivational strategies on student motivation', *TESOL Quarterly,* vol. 42, no. 1, pp. 55-77.

Harding, J. (2013) *Qualitative Data Analysis from Start to Finish,* London*,* Sage.

Henriksen, B. (1999) 'Three dimensions of vocabulary development', *Studies in Second Language Acquisition,* vol. 21, no. 2, pp. 303 - 317.

Hinkel, E. (ed.) (2005) *Handbook of Research in Second Language Teaching and Learning,* Mahwah, NJ*,* Lawrence Erlbaum Associates.

Ho, D. (2006) 'The focus group interview: rising to the challenge in qualitative research methodology', *Australian Review of Applied Linguistics,* vol. 29, no. 1, pp. 5.1-5.1.

Holley, F.M. and King, J.K. (1971) 'Vocabulary glosses in foreign language reading materials', *Language Learning,* vol. 21, no. 2, pp. 213-219.

Holmberg, B. (2005) 'The evolution, principles and practices of distance education', *Studien und Berichte der Arbeitsstelle Fernstudienforschung der Carl von Ossietzky Universität Oldenburg [ASF],* vol. 11, pp. Bibliotheks- und Informationssystem der Universität Oldenburg.

Huckin, T. and Coady, J. (1997) *Second Language Vocabulary Acquisition: A Rationale for Pedagogy,* Cambridge, Cambridge University Press.

Huckin, T. and Coady, J. (1999) 'Incidental vocabulary acquisition in a second language: a review', *Studies in Second Language Acquisition,* vol. 21, no. 2, pp. 181-193.

Hulstijn, J.H. (1993) 'When do foreign-language readers look up the meaning of unfamiliar words? The influence of task and learner variables', *The Modern Language Journal,* vol.77, issue 2, pp.139-147.

Hulstijn, J.H. (2001) 'Intentional and incidental second language vocabulary learning: A reappraisal of elaboration, rehearsal, and automaticity' in Robinson, P. (ed.) *Cognition and Second Language Instruction*, Cambridge, Cambridge University Press, pp. 258-286.

Hulstijn, I.H. and Laufer, B. (2001) 'Some empirical evidence for the involvement load hypothesis in vocabulary acquisition'*, Language Learning*, vol. 51, issue 3, pp. 539–558.

Hulstijn, J.H., Hollander, M. and Greidanus, T. (1996) 'Incidental vocabulary learning by advanced foreign language students: the influence of marginal glosses, dictionary use, and

reoccurrence of unknown words', *The Modern Language Journal,* vol. 80, no. 3, pp. 327.

Hunt, A. and Beglar,D. (2005) ' A framework for developing EFL reading vocabulary', Reading in a Foreign Language, vol. 17, no. 1, April 2005 [Online]. Available at http://nflrc.hawaii.edu/rfl/April2005/hunt/hunt.html (accessed on 2.1.2015)

Hurd, S. and Lewis, T. (2008) *Language Learning Strategies in Independent Settings,* Clevedon*,* Multilingual Matters.

Jacobs, G.M., Dufon, P. and Hong, F.C. (1994) 'L1 and L2 vocabulary glosses in L2 reading passages: their effectiveness for increasing comprehension and vocabulary knowledge', *Journal of Research in Reading,* vol. 17, no. 1, pp. 19.

Jiang, N. (2002) 'Form-meaning mapping in vocabulary acquisition in a second language', *Studies in Second Language Acquisition,* vol. 24, no. 4, pp. 617-637.

Johnson, R.B. and Onwuegbuzie, A.J.(2004) 'Mixed methods research: a research paradigm whose time has come', Educational Researcher, vol.33, no. 7, pp. 14-26.

Jones, R.L. and Tschirner, E. (2006) *A Frequency Dictionary of German. Core Vocabulary for Learners,* London*,* Routledge.

Jones, L. (2004) 'Testing L2 vocabulary recognition and recall using pictorial and written test items', *Language Learning & Technology,* vol. 8, no. 3, pp. 122-143.

Jost, A. (1897) Die Assoziationsfestigkeit in ihrer Abhängigkeit von der Verteilung der Wiederholungen, Zeitschrift für Psychologie und Physiologie der Sinnesorgane, 14, 436-472.

Judd, E.L. (1978) 'Vocabulary teaching and TESOL: a need for re-evaluation of existing assumptions', *TESOL Quarterly*, 12, pp. 71-76.

Kang, S. and Dennis, J.R. (1995) 'The effects of computer-enhanced vocabulary lessons on achievement of ESL grade school children', *Computers in the Schools,* vol. 11, no. 3, pp. 25 35.

Kapp, K.M. (2012) '5 gaming elements for effective e-learning', *Training Industry Quarterly*, pp. 31-33 [Online]. Available at http://www.nxtbook.com/nxtbooks/trainingindustry/tiq_2012fall/index.php?startid=31#/30 (accessed on 2.1.2015)

Kapp, K.M. (2012) 'Games, Gamification and the Quest for Learning Engagement*'* [Online]. Available at: https://www.td.org/Publications/Magazines/TD/TD-Archive/2012/06/Games-Gamification-and-the-Quest-for-Learner-Engagement (Accessed 2.1.2015)

Keating, G.D. (2008) 'Task effectiveness and word learning in a second language: the Involvement Load hypothesis on trial', *Language Teaching Research,* vol. 12, no. 3, pp. 365 386.

Keller, J.M. (1983) 'Motivational design of instruction' in Reigeluth, C.M. (ed.) *Instructional Design Theories and Models: An Overview of their Current Status*, Hillsdale, NJ, Erlbaum.

Kelly, P. (1990) 'Guessing: no substitute for systematic learning of lexis', *System,* vol. 18, no. 2, pp. 199.

Kim, Y. (2008) 'The Role of task-induced involvement and learner proficiency in L2 vocabulary acquisition', *Language Learning,* vol. 58, no. 2, pp. 285-325.

Klapper, J. (2008) 'Deliberate and incidental: vocabulary learning strategies in independent second language learning', in Hurd, S. and Lewis, T.,(eds.) (2008) *Language Learning Strategies in Independent Settings*, vol. 33, Clevedon, Multilingual Matters.

Knight, S. (1994) ‘Dictionary use while reading: the effects on comprehension and vocabulary acquisition for students of different verbal abilities’, *The Modern Language Journal,* no. 3, pp. 285.

Knight, S. (1994) ‘Dictionary: The Tool of Last Resort in Foreign Language Reading? A New Perspective’, *The Modern Language Journal,* vol. 78, no. 3, pp. 285.

Kornell, N. and Bjork, R.A. (2008) ‘Optimising self-regulated study: The benefits - and costs – of dropping flashcards’, *Memory,* vol. 16, no. 2, pp. 125-136.

Koster, R (2010) *Theory of Fun for Game Design*, 2nd ed., Sebastopol, O’Reilly Media Inc.

Kulhavy, R. W. and Wager, W. (1993) ‘Feedback in programmed instruction: historical context and implications for practice’, pp. 3-20, in Dempsey, J.V. and Sales, G.C. (eds.) *Interactive Instruction and Feedback*, Englewood Cliffs, NJ, Educational Technology Publications.

Lai, C. and Gu, M. (2011) ‘Self-regulated out-of-class language learning with technology’, *Computer Assisted Language Learning,* vol. 24, no. 4, pp. 317-335.

Laufer, B. (1997) ‘The lexical plight in second language reading: words you don’t know, words you think you know and words you can’t guess’, pp. 20-52, in Coady, J. and Huckin, T. (eds.) (1997) *Second Language Vocabulary Acquisition: A Rationale for Pedagogy,* Cambridge, Cambridge University Press.

Laufer, B. (2005) ‘Focus on form in second language vocabulary learning’, *EUROSLA Yearbook,* vol. 5, pp. 223-250.

Laufer, B. and Goldstein, Z. (2004) ‘Testing vocabulary knowledge: size, strength, and

computer adaptiveness', *Language Learning,* vol. 54, no. 3, pp. 399-436.

Laufer, B. and Shmueli, K. (1997) 'Memorizing new words: does teaching have anything to do with it?', *RELC Journal,* vol. 28, no. 1, pp. 89.

Lee, S.H. (2003) 'ESL learners' vocabulary use in writing and the effects of explicit vocabulary instruction', *System,* vol. 31, no. 4, pp. 537.

Leitner, S. (1972) *So lernt man lernen,* Freiburg, Herder.

Litosseliti, L. (ed.) (2010) *Research Methods in Linguistics*, London, Continuum, pp. 155-179.

Littlewood, W.T. (1981) Communicative Language Teaching: an Introduction, Cambridge, Cambridge University Press.

Liu, N. and Nation, I.S.P. (1985) 'Factors affecting guessing vocabulary in context', *RELC Journal: A Journal of Language Teaching and Research in Southeast Asia,* vol. 16, no. 1, pp. 33-42.

Lockhart, R.S. and Craik, F.I. (1990) 'Levels of processing: A retrospective commentary on a framework for memory research', *Canadian Journal of Psychology/Revue Canadienne de Psychologie,* vol. 44, no. 1, pp. 87-112.

Lomicka, L.L. (1998) ''To gloss or not to gloss': an Investigation of reading comprehension online', *Language Learning & Technology: A Refereed Journal for Second and Foreign Language Educators,* vol. 1, no. 2, pp. 41-50.

Long, M.H. (1981) 'Input, interaction, and second-language acquisition', *Annals of the New York Academy of Sciences, 379(1), 259-278.*

Long, M.H. (1988) 'Instructed interlanguage development' pp. 115-141 in Beebe, L. (ed.) *Issues in Second Language Acquisition: Multiple Perspectives,* New York, Newbury House.

Luckin, R. (2008) 'The learner centric ecology of resources: a framework for using technology to scaffold learning', *Computers & Education,* vol. 50, no. 2, pp. 449-462.

Luppescu, S. and Day, R.R. (1993) 'Reading, dictionaries, and vocabulary Learning', *Language Learning,* vol. 43, no. 2, pp. 263-287.

Lyle, K. B. and Crawford, N. A. (2011) 'Retrieving essential material at the end of lectures improves performance on statistics exams', *Teaching of Psychology*, 38, pp. 94–97.

Ma, Q. and Kelly, P. (2006) 'Computer assisted vocabulary learning: design and evaluation', *Computer Assisted Language Learning,* vol. 19, no. 1, pp. 15-45.

Mason, B. and Krashen, S. (2004) 'Is form-focused vocabulary instruction worthwhile?', *RELC Journal,* vol. 35, no. 2, pp. 179.

McKeown, M. G. and Curtis, M. E. (eds.) (1987) *The Nature of Vocabulary Acquisition*, Hillsdale, NJ, Erlbaum.

McLaughlin, B. (1990), 'Restructing', *Applied linguistics,* vol. 11, no. 2, pp. 113-128.

Meara, P. (1990) 'A note on passive vocabulary', *Second Language Research,* vol. 6, no. 2, pp. 150-154.

Meara, P. (1997) 'Towards a new approach to modelling vocabulary acquisition', pp. 109 121, Schmitt, N. and McCarthy, M. (eds.) *Vocabulary: Description, Acquisition and Pedagogy*, Cambridge, Cambridge University Press.

Mertens, D.M. (2005) *Research Methods in Education and Psychology: Integrating Diversity with Quantitative and Qualitative Approaches, Thousand Oaks, Sage.*

Meumann, Ernst (1908) *Über Ökonomie und Technik des Lernens*, Leipzig, J. Klinkhardt.

Miles, M. B., and Huberman, A. M. (1994) *Qualitative Data Analysis: An Expanded Sourcebook,* Thousand Oaks, Sage.

Mondria, J. and Boer, M.W. (1991) 'The effects of contextual richness on the guessability and the retention of words in a foreign language', *Applied Linguistics,* vol. 12, no. 3, pp. 249 267.

Moore, M.G. and Kearsley, G. (2005) *Distance Education: A Systems View,* Belmont, CA, Wadsworth.

Morgan, D.L.(1996) 'Focus groups', *Annual Review of Sociology,* vol. 22, no. 1, pp. 129.

Mounteney, M. (2010) *'*Spaced repetition learning systems (SRS)*'* [Online] Available at: http://papilona.blogspot.co.uk/2010/12/spaced-repetition-learning-systems-srs.html (Accessed 2.1.2015)

Myong, H.K.(1995) 'Glossing in incidental and intentional learning of foreign language vocabulary and reading', *University of Hawaii Working Papers in ESL*, pp. 49-94.

Nakamura, J. and Csikszentmihalyi, M.(2001) 'Flow theory and research', pp. 195-206, in Snyder Erik Wright, C.R. and Lopez, L. S. J.(eds) (2001) *Handbook of Positive Psychology,* Oxford, Oxford University Press.

Nakata, T. (2008) 'English vocabulary learning with word lists, word cards and computers:

Implications from cognitive psychology research for optimal spaced learning', *ReCALL,* vol. 20, no. 1, pp. 3-20.

Nakata, T. (2011) 'Computer-assisted second language vocabulary learning in a paired associate paradigm: a critical investigation of flashcard software', *Computer Assisted Language Learning,* vol. 24, no. 1, pp. 17-38.

Nation, I.S.P. (1982) 'Beginning to learn foreign vocabulary: A review of the research', *RELC Journal,* 13(1), pp. 14-36.

Nation, I.S.P. (2001) *Learning vocabulary in another language,* Leipzig, Ernst Klett Sprachen.

Nation, I.S.P. (2005) 'Teaching and learning vocabulary', pp. 581-595, in Hinkel, E. (ed.) (2005) *Handbook of Research in Second Language Teaching and Learning,* Mahwah, NJ*,* Lawrence Erlbaum Associates.

Nation, I.S.P. and Carter, R. (1989) *Vocabulary Acquisition. AILA Review 6*, Amsterdam*,* Association Internationale de Linguistique Appliquee.

Nation, I. S. P. and Gu, P. Y. (2007) *Focus on Vocabulary*, Sydney, National Centre for English Language Teaching and Research.

Nation, I. S. P. and Nation, D. (1990) *Teaching and Learning vocabulary,* Boston, Heinle & Heinle.

Nelson, B. (1998) 'Web-based vocabulary activities: pedagogy and practice', *Computer Assisted Language Learning,* vol. 11, no. 4, pp. 427-35.

Nesselhauf, N. and Tschichold, C. (2002) 'Collocations in CALL: an investigation of

vocabulary-building software for ESL, Computer Assisted Language Learning, vol. 15, no. 3, pp. 251-279.

Nunan, D. (1992) *Research Methods in Language Learning,* Cambridge, Cambridge University Press.

O'Malley, J. M. and Chamot, A. U. (1990) *Learning Strategies in Second Language Acquisition,* Cambridge*,* University Press.

O'Malley, J.M., Chamot, A.U., Stewner-Manzanares, G., Kupper, L. and Russo, R.P. (1985) 'Learning Strategies used by beginning and intermediate ESL students', *Language Learning,* vol. 35, no. 1, pp. 21-46.

Onwuegbuzie, A.J. (2009) 'Mixed methods research', Aug. 7, 2009, Sam Houston State University. [Online]. Available at http://videolectures.net/ssmt09_onwuegbuzie_mmr/

Oxford, R.L. (1990) *Language learning strategies*, Alabama*,* Heinle and Heinle.

Paivio, A. and Desrochers, A. (1981) 'Mnemonic techniques in second-language learning', *Journal of Educational Psychology,* vol. 73, no. 6, pp. 780-795.

Parry, K. (1993) 'Too many words: learning the vocabulary of an academic subject' pp. 109 129, in Huckin, T., Haynes, M and Coady, J. (eds.) *Second Language Reading and Vocabulary Learning,* Norwood, NJ, Ablex Publishing Corporation.

Pennington, M.C. (ed.) *The Power of CALL*. Houston: Athelstan.

Pimsleur, P. (1967) 'A memory schedule', *The Modern Language Journal,* vol. 51(2), pp. 73 75.

Polkinghorne, D. E. 2005, ‘Language and meaning: Data collection in qualitative research’, Journal of Counseling Psychology, 52, 137-145.

Pomerantz, A. and Bell, N.D. (2007) ‘Learning to play, playing to learn: FL learners as multicompetent language users’, *Applied Linguistics* vol.28, no.4, pp. 556–578.

Prensky, M. (2003) ‘Digital game-based learning’, *Computers in Entertainment (CIE)*, *1*(1), 21-21.

Pressley, M., Levin, J.R. and Delaney, H.D. (1982) ‘The Mnemonic keyword method’, *Review of Educational Research,* vol. 52, no. 1, pp. 61-91.

Pressley, M., Levin, J. R. and McDaniel, M. A. (1987) ‘Remembering versus inferring what a word means: mnemonic and contextual approaches‘ in McKeown, M. G. and Curtis, M. E. (eds.) (1987) *The Nature of Vocabulary Acquisition*, Hillsdale, NJ, Erlbaum.

Pressley, M., Levin, J.R. and Miller, G.E. (1982) ‘The keyword method compared to alternative vocabulary-learning strategies’, *Contemporary Educational Psychology,* vol. 7, no. 1, pp. 50-60.

Prince, P. (1996) ‘Second language vocabulary learning: The role of context versus translations as a function of proficiency’, *The Modern Language Journal,* vol. 80(4), pp. 478 493.

Puchta, C. and Potter, J. (1999) ‘Asking elaborate questions: focus groups and the management of Spontaneity’, *Journal of Sociolinguistics,* vol. 3, no. 3, pp. 314-335.

Pyc, M.A. and Rawson, K.A. (2007) ‘Examining the efficiency of schedules of distributed retrieval practice’, *Memory & Cognition*, 35, pp. 1917-1927.

Pyc, M.A. and Rawson, K.A. (2009) 'Testing the retrieval effort hypothesis: Does greater difficulty correctly recalling information lead to higher levels of memory?', *Journal of Memory and Language*, 60, pp. 437-447.

Raessens, J. and Goldstein, J. 2011, *Handbook of Computer Game Studies,* The MIT Press.

Ramachandran, S.D. and Rahim, H.A. (2004) 'Meaning recall and retention: the impact of the translation method on elementary level learners' vocabulary learning', *RELC Journal,* vol. 35, no. 2, p.161.

Rapeepisarn, K., Wong, K.W., Fung, C.C. and Khine, M.S. (2008) 'The relationship between game genres, learning techniques and learning styles in educational computer games', *Lecture Notes in Computer Science,* no. 5093, pp. 497-508.

Read, J. (2004) '7. Research in teaching vocabulary', *Annual Review of Applied Linguistics,* vol. 24, no. 1, pp. 146-161.

Read, J. (1993) 'The development of a new measure of L2 vocabulary knowledge', *Language Testing,* vol. 10, no. 3, pp. 355-371.

Reigeluth, C.M. (ed.) (1983) *Instructional Design Theories and Models: An Overview of their Current Status*, Hillsdale, NJ, Erlbaum.

Richards, J.C. (1976) 'The role of vocabulary teaching', *TESOL Quarterly,* no. 1, pp. 77.

Richards, J.C. (2006) *Communicative Language Teaching Today*, Cambridge, Cambridge University Press.

Richardson, J. (1996) *Handbook of Qualitative Research Methods for Psychology and the Social Sciences,* Hoboken, NJ*,* Wiley-Blackwell.

Rieber, R.W. and Wollock, J. (eds.) (1987) *The Collected Works of L. S. Vygotsky*, New York, Plenum Press.

Rivers, W.M. (1987) *Interactive Language Teaching,* New York, NY, Cambridge University Press.

Robinson, G.L. (1991) 'Effective feedback strategies in CALL: learning theory and empirical research', in Dunkel, P. (1991) *Computer-Assisted Language Learning and Testing: Research Issues and Practice,* The University of Michigan, Newbury House.

Robinson, P. (ed.) (2001) *Cognition and Second Language Instruction*, Cambridge, Cambridge University Press.

Robinson, P. (2003) 'The cognition hypothesis, task design, and adult task-based language learning', Second Language Studies, pp. 45-105.

Roediger III, H. L., Putnam, A.L. and Smith, M.A. (2011) 'Ten benefits of testing and their applications to educational practice', *Psychology of Learning and Motivation*, vol. 55

Rollinghoff, A. (1993) 'Implementing word learning strategies into an interactive learning environment', *CALICO Journal,* vol. 11, no. 2, pp. 21-44.

Rooney, J.E. (2003) 'Blending learning opportunities to enhance educational programming and meetings', *Association Management*, 55 (5), pp. 26-32.

Rott, S., Williams, J. and Cameron, R. (2002) 'The effect of multiple-choice L1 glosses and

input-output cycles on lexical acquisition and retention', *Language Teaching Research,* vol. 6, no. 3, pp. 183-222.

Rushkoff, D. (2005) 'Get back in the box: innovation from the inside out', *Publishers Weekly,* vol. 252, no. 45, p.61.

Ryan, G.W. and Bernard, H.R. (2003) 'Techniques to identify themes'*, Field Methods*, vol. 15, no. 1, 85-109.

Sadtono, E. (ed.) (1991) *Language Acquisition and the Second/Foreign Language Classroom*, Singapore, RELC.

Salen, K. (ed.) The Ecology of Games: Connecting Youth, Games, and Learning, Cambridge, MA: The MIT Press.

Sanaoui, R. (1995) 'Adult learners' approaches to learning vocabulary in second languages', *The Modern Language Journal,* vol. 79, no. 1, pp. 15.

Schmidt, R., and Watanabe, Y. (2001) 'Motivation, strategy use, and pedagogical preferences in foreign language learning ', pp. 313-359, in Dörnyei, Z. and Schmidt, R. (eds.) (2001) *Motivation and Second Language Acquisition,* Honolulu, University of Hawaii Press.

Schmidt, R.W. (1990) 'The role of consciousness in second language learning', *Applied Linguistics,* vol. 11, no. 2, pp. 129-158.

Schmitt, N. (1997) 'Vocabulary learning strategies' pp. 199-227, in Schmitt, N. and McCarthy, M. (eds.) (1997) *Vocabulary: Description, Acquisition and Pedagogy,* Cambridge, Cambridge University Press.

Schmitt, N. (2008) 'Instructed second language vocabulary learning', *Language Teaching Research,* vol. 12, no.3, pp. 329-363.

Schmitt, N. and McCarthy, M. (eds.) (1997) *Vocabulary: Description, Acquisition and Pedagogy,* Cambridge, Cambridge University Press.

Segalowitz, N., Watson, V. and Segalowitz, S. (1995) 'Vocabulary skill: single-case assessment of automaticity of word recognition in a timed lexical decision task', *Second Language Research,* vol. 11, no. 2, pp. 121-36.

Segler, T.M. (2001), 'PhD research proposal: second language vocabulary acquisition and learning strategies in ICALL environments' [Online] Available at: http://academic.research.microsoft.com/Publication/6303323/phd-research-proposal-second-language-vocabulary-acquisition-and-learning-strategies-in-icall

Segler, T.M., Pain, H. and Sorace, A. (2002) 'Second language vocabulary acquisition and learning strategie in ICALL environments', *Computer Assisted Language Learning,* vol. 14, no. 4, pp.409-422.

Seibert, L. (1927) 'An experiment in learning French vocabulary', *Journal of Educational Psychology,* vol. 18, pp. 294-309.

Seibert, L. (1930) 'An experiment of the relative efficiency of learning French in associated pairs vs. studying French words in context', *Journal of Educational Psychology,* vol. 21, pp. 297-314.

Selinger, M. (2004) 'Cultural and pedagogical implications of a global e-learning programme', *Cambridge Journal of Education,* vol. 34, no. 2, pp. 223-239.

Sheerin, S. (1997) 'An exploration of the relationship between self-access and independent learning', pp. 54-65, in Benson, P. and Voller, P. (eds) (1997) *Autonomy and Independence in Language Learning,* London, Longman.

Shillaw, J. (1995) 'Using a word list as a focus for vocabulary learning', *The Language Teacher,* vol. 19(2), pp. 58-59.

Siegel, M.A. and Misselt, A.L.(1984) 'Adaptive feedback and review paradigm for computer based drills', *Journal of Educational Psychology,* vol. 76, no. 2, pp. 310-317.

Singleton, D.M. (1999) *Exploring the second language mental lexicon,* Leipzig, Ernst Klett Sprachen.

Smith, B. (2004) 'Computer-mediated negotiated interaction and lexical acquisition', *Studies in Second Language Acquisition,* vol. 26, no. 3, pp. 365-398.

Smith, M.S. (1993) 'Input enhancement in instructed SLA: theoretical bases', *Studies in Second Language Acquisition,* vol. 15, no. 2, pp. 165-79.

Snyder Erik Wright, C.R. and Lopez, L. S. J. (eds) (2001) *Handbook of Positive Psychology,* Oxford, Oxford University Press.

Sökmen, A.J. (1997) 'Current trends in teaching second language vocabulary', pp. 237-257, in Schmitt, N. and McCarthy, M. (eds.) (1997) *Vocabulary: Description, Acquisition and Pedagogy,* Cambridge, Cambridge University Press.

Spitzberg, B. (2006) 'Preliminary development of a model and measure of computer mediated communication (CMC) competence', *Journal of Computer Mediated Communication,* vol. 11, no. 2, pp. 629-666.

Stahl, B.C., Tremblay, M.C. and LeRouge, C.M. (2011) 'Focus groups and critical social IS research: how the choice of method can promote emancipation of respondents and researchers', *European Journal of Information Systems,* vol.20, no. 4, pp. 378-394.

Stickler, U. and Hampel, R. (2007) ''What I think works well...': Learners' evaluation and actual usage of online tools', *Proceedings of the International Conference of Interactive Computer Aided Learning, ICL, 2007 Conference, Villach, Austria.*

Sunderman, G., and Kroll, J. F. (2006) 'First language activation during second language Lexical processing: An investigation of lexical form, meaning, and grammatical class', *Studies in Second Language Acquisition,* vol. 28(03), pp. 387-422.

Sykes, J.M. and Reinhardt, J. (2013) *Language at Play*, New Jersey, Pearson.

Tashakkori, A. and Teddlie, C. (eds) (2004) *Handbook of Mixed Methods in Social and Behavioural Research*, Thousand Oaks, Sage.

Thorndike, E.L. (1931) Human Learning, New York, The Century Co. Available at: http://babel.hathitrust.org/cgi/pt?id=mdp.39015010306069;view=1up;seq=12 (accessed on 2.1.2015)

Trask, R.L. (1993) *A Dictionary of Grammatical Terms in Linguistics,* Hove, Psychology Press.

Tseng, W.T. and Schmitt, N. (2008) 'Toward a model of motivated vocabulary learning: A structural equation modelling approach', *Language Learning* 58:2, pp. 357–400.

Tulving, E. and Craik, F.I.M. (eds.) (2000) *The Oxford Handbook of Memory*, New York: Oxford University Press.

Ushioda, E.(2001) ‘Language learning at university: exploring the role of motivational thinking’, *Motivation and Second Language Acquisition,* vol. 23, 93-125.

Van Bussel, F. J. J. (1994) ‘Design rules for computer-aided learning of vocabulary items in a second language’, *Computers in Human Behavior,* vol. 10, no. 1, pp. 63.

Warschauer, M. (2000) ‘CALL for the 21st century’, IATEFL and ESADE Conference, Barcelona, Spain.

Warschauer, M. and Healey, D. (1998) ‘Computers and language learning: an overview’, *Language Teaching: The International Abstracting Journal for Language Teachers, Educators and Researchers,* vol. 31, no. 2, pp. 57-71.

Watanabe, Y. (1997) ‘Input, intake, and retention effects of increased processing on incidental learning of foreign language vocabulary’, *Studies in Second Language Acquisition,* vol. 19, no. 3, pp. 287-307.

Webb, S. (2007a) ‘The effects of repetition on vocabulary knowledge’, *Applied Linguistics,* vol. 28, no.1, pp. 46-65.

Webb, S. (2007b) ‘Learning word pairs and glossed sentences: the effects of a single context on vocabulary knowledge’, *Language Teaching Research,* vol. 11, no. 1, pp. 63-81.

Wesche, M. and Paribakht, T.S. (1994) ‘Enhancing vocabulary acquisition through reading: a hierarchy of text-related exercise types’, Paper presented at the *Annual Meeting of the American Association for Applied Linguistics*, Baltimore.

White, C. (2008) ‘Language learning strategies in independent language learning: An overview. ’ in Hurd, S. and Lewis, T. (2008) *Language Learning Strategies in Independent Settings,* Clevedon, Multilingual Matters.

Williams, M. and Burden, R. (1997) *Psychology for Language Teachers,* Cambridge, Cambridge University Press.

Wong, I. F. and Lim, S. C. (1983) 'Language transfer in the use of English in Malaysia: structure and meaning', *Transfer and Translation in Learning and Teaching,* pp. 119-143.

Wozniak, P. A. (1990) 'Optimization of learning', Master Thesis, University of Technology in Poznan. Available at: http://www.supermemo.com/english/ol.htm

Wozniak, P. A. (1995)' Economics of learning', PhD Dissertation, University of Economics in Wroclaw. Available at: http://www.supermemo.com/english/el.htm

Yang, Y. (2010) 'Computer-assisted foreign language teaching: theory and practice', *Journal of Language Teaching and Research,* vol. 1, no. 6, pp. 909-912.

Young, J.R. (2002) ''Hybrid' teaching seeks to end the divide between traditional and online instruction', *Chronicle of Higher Education, p.33*

Zaromb, F. M., Karpicke, J. D. and Roediger, H. L., III (2010) 'Comprehension as a basis for metacognitive judgments: effects of effort after meaning on recall and metacognition', *Journal of Experimental Psychology: Learning, Memory, and Cognition,* 36, pp. 552–557.

Appendices

Appendix 1 – Links collection to vocabulary sets on Quizlet

Rundblick Vocabulary on Quizlet – the complete set

http://quizlet.com/1429908/rundblick-thema-1-flash-cards/

http://quizlet.com/1611510/rundblick-thema-2-flash-cards/

http://quizlet.com/1621437/rundblick-thema-3-flash-cards/

http://quizlet.com/1659556/rundblick-thema-4-flash-cards/

http://quizlet.com/1859599/rundblick-thema-5-flash-cards/

http://quizlet.com/2160610/rundblick-thema-6-flash-cards/

http://quizlet.com/2324853/rundblick-thema-7-flash-cards/

http://quizlet.com/2394135/rundblick-thema-8-flash-cards/

http://quizlet.com/3038833/rundblick-thema-9-flash-cards/

http://quizlet.com/3166064/rundblick-thema-10-flash-cards/

http://quizlet.com/5911884/rundblick-thema-11-flash-cards/

http://quizlet.com/6143287/rundblick-thema-12-flash-cards/

Appendix 2 – Vocabulary test items (Tests 1, 2 & 3)

Test 1&3 items		
house	petrol station	holiday village
report	cathedral	Middle Ages
pet	high	restored, renovated
people	mother	rest, peace
problem	postcode	exit
bed	break, pause	traffic problem
four	car park	North Sea
discussion round	publishing house	date
opinion	credit card	floor, storey
to fill in	shape, form	doctor
average	heart	hour
South	transport ticket	view
afternoon	lunch break	quarter
coast	ship, boat	inhabitant
to collect	(clock) time	trade fair; (rel.) mass
cheap	terrace, pation	group
nurse	worker	money
our	location, situation	teacher
unit	stationery	vet
street	holiday	broadcast
work	birthday	trade, craft
through	car	ground floor
working day	office	driver
(girl) friend	profession, job	flight departure
school director	wave, phase	value added tax
tent	(boy) friend	town hall
entrance	inn	garage, workshop
three (times)	bit	to earn
public holiday	conversation	police
side	rail, train	colour
bank	valley	son
individually	entrance (fee)	boarding school
door	seasons	month
guided tour	departure	girl
	manager	public authority, administration
		balcony
		platform

early	flight	night shift
food, meal	beginning of spring	dialling code
strength, power, energy	number	order
price	newspaper	week
to remain, stay	evening	industry sector
town centre	business; bustle	visit
place, square	firm	lift
end of the working day	alarm clock	shower
free of charge	century	
convent, monastery	book	
castle, fortress	to take	
end	part	
ferry	nursery, market garden	
autumn	pedestrian zone	
bathroom	appointment	

Test 2 items		
approximately	platform	credit card
hour	food, meal	car park
profession, job	guided tour	town hall
cheap	price alteration	wave, phase
painting	place, square	tent
tower	back	history
cordial, heartfelt	value added tax	special price
century	satellite television	overnight stay
to greet	vicinity	bed and breakfast
four	art	street
pet	to see	side
to work	cathedral	percent
our	form	police
view	engineer	firm
to be able to, can	canteen	location, situation
bed	price	reserved
discussion round	leisure time	plane
three (times)	young	building
transport ticket	reading room	holiday
wonderful	luxury	farm
smoking room	entrance (fee)	shopping centre
but	duration	bike hire
through	exit	town centre
group	castle, fortress	departure
		counter
		machine
		photographer

bathroom	harbour	cot
daughter	individual	ship, boat
terrace, patio	coast	number
to repeat	motorway	South
flight departure	lift	seat
furnished	free of charge	German federal state
postcode	reservation	girl (friend)
old-age pensioner	balcony	North Sea
to fill in	flight	inhabitant
person on work experience	area	floor
beer garden	cinema	holiday flat
parents	market	escalator
bedroom	town map	centre, core
internet connection	day	garage, workshop
maybe	diversion	baggage hall
dialling code	meeting point	offer
son	one-way street	car hire
restored	pedestrian zone	high
holiday village	people	
teacher	famous sights	
(bus) stop	key	
evening	ferry	
rail, train	boy (friend)	
to take	heart	
bad	shower	
	breakfast	

common core vocabulary	
(boy) friend	individual
balcony	inhabitant
bath(room)	lift
bed	location, situation
but	North Sea
car park	number
castle, fortress	our
cathedral	pedestrian zone
century	people
cheap	pet
coast	place, square
credit card	platform
departure	police
dialling code	postcode

discussion round entrance (fee) evening exit famous sights ferry firm flight flight departure floor four free of charge garage, workshop group guided tour heart high holiday holiday village hour	price profession, job rail, train restored, renovated ship, boat shower side son South street teacher tent terrace, patio three (times) to fill in to take town centre town hall transport ticket value added tax view wave, phase

Appendix 3 – Vocabulary Test 1 (3)

This is a copy of the online Vocabulary Test 1&3 provided via GoogleDocs.
https://spreadsheets.google.com/viewform?formkey=dHZLWUJYdElhVkgzenkxUFdhV3l3V3c6MQ

Vocabulary Test 1 (Rundblick Thema 2)

Please provide your translations in German. Ensure that you provide genders (i.e. 'der, die, das') for nouns. Don't forget to start the test by inserting your Participant I.D. you made up for yourself and which you also used in your questionnaire. (A word, followed by three digits, e.g. grapefruit123)

PARTICIPANT I.D.:

high

car

approximately, about

hour

profession, job

cheap

painting

tower

cordial, heart-felt

century

to greet

four

pet

to work

our

view

to be able to; can

bed

discussion round

three (times)

transport ticket

wonderful

smoking room

but

through

group

bath(room)

daughter

terrace, patio

to repeat

flight departure

furnished, equipped

postcode

old-age pensioner

to fill in

person on work experience

beer garden

parents

bedroom

internet connection

maybe

dialling code

son

restored, renovated

holiday village

teacher

(bus) stop

evening

rail, train

to take

bad

platform

food, meal

guided tour

price alteration

place, square

back

value added tax

satellite television

vicinity

art

to see

cathedral

form

engineer

canteen

price

leisure time

young

reading room

luxury

entrance (fee)

duration

exit

castle, fortress

harbour

individual

coast

motorway

lift

free of charge

reservation, booking

balcony

flight

area

cinema

market

town map

day

diversion

meeting point

one-way street

pedestrian zone

people

famous sights

key

ferry

(boy) friend

heart

shower

breakfast

credit card

car park

town hall

key

wave, phase

tent

history

special price

overnight stay

bed&breakfast

street

side

percent

police

firm

location, situation

reserved

plane

building

holiday

farm

shopping centre

bike hire

town centre

departure

counter

machine

photographer

cot

ship, boat

number

South

seat

German federal state

(girl) friend

North Sea

inhabitant

floor

holiday flat

escalator

centre, core

garage, workshop

baggage hall

offer

If you would like to leave feedback on this test or the study, please use the space below.

Thank you.

Appendix 4 – Vocabulary Test 2

Online Test 2 – copied from https://www.surveymonkey.com/r/KZNQ37Q

Vocabulary Test 2 (Rundblick Thema 2_4)

* 1. Please provide your translations in German. Ensure that you provide genders (i.e. ‘der, die, das’) for nouns.
If you don't have access to Umlaute or ß, use the following replacements:
ä - ae, ö - oe, ü - ue, ß - ss.
Remember to complete the questions at the end of this test about your vocabulary learning during Rundblick Thema 4 study.
Don't forget to start the test by inserting your OU Personal Identifier. Please ensure that this is the same as the one you have used/are going to use on the questionnaire.
If you want to stop at any stage and return later, scroll down to the bottom and press ‘Done’. Your responses will be saved and you can return later via the link.

OU PERSONAL IDENTIFIER:

2. task

3. house (each word is followed by a box as for 2. but these have been deleted for reasons of space)
4. report
5. pet
6. people
7. problem
8. bed
9. lorry driver
10. four
11. buyer
12. discussion round
13. opinion
14. to fill in
15. average
16. South
17. afternoon
18. coast

19. to collect
20. cheap
21. nurse
22. our
23. unit
24. street
25. work
26. through
27. working day
28. day
29. (girl) friend
30. school director
31. tent
32. entrance
33. three (times)
34. public holiday
35. side
36. bank
37. individual/ly
38. door
39. guided tour
40. early
41. food, meal
42. strength, power, energy
43. price
44. to remain, stay
45. town centre
46. place, square
47. end of the working day
48. free of charge
49. convent, monastery
50. castle, fortress
51. end
52. ferry
53. autumn
54. bath(room)
55. petrol station
56. cathedral
57. high
58. mother
59. postcode
60. break, pause
61. car park
62. publishing house
63. credit card
64. shape, form
65. heart
66. transport ticket
67. lunch break

68. ship, boat
69. (clock) time
70. terrace, patio
71. worker
72. location, situation
73. stationery
74. holiday
75. birthday
76. car
77. office
78. profession, job
79. wave, phase
80. (boy) friend
81. inn
82. but
83. conversation
84. rail, train
85. valley
86. entrance (fee)
87. seasons
88. departure
89. manager
90. flight
91. beginning of spring
92. number
93. newspaper
94. evening
95. business; bustle
96. firm
97. alarm clock
98. century
99. book
100. to take
101. part
102. nursery, market garden
103. pedestrian zone
104. appointment
105. holiday village
106. Middle Ages
107. restored, renovated
108. rest, peace
109. exit
110. traffic problem
111. North Sea
112. date
113. floor, storey
114. doctor
115. hour
116. view

117. quarter
118. inhabitant
119. trade fair; (rel.) mass
120. group
121. money
122. teacher
123. vet
124. broadcast
125. trade, craft
126. ground floor
127. driver
128. flight departure
129. value added tax
130. town hall
131. garage, workshop
132. to earn
133. police
134. colour
135. son
136. boarding school
137. month
138. girl
139. public authority, administration
140. balcony
141. platform
142. night shift
143. dialling code
144. order
145. week
146. industry sector
147. visit
148. lift
149. shower
150. famous sights

151. During your study of Thema 4, how much time did you spend on learning vocabulary, using the Quizlet programme, per week?

- less than 1 hour per week
- between 1 and 2 hours per week
- more than 1 hour a week but less than 4 hours a week
- more than 4 hours a week
- I did not use Quizlet

152. If you did not use Quizlet, or only used Quizlet in connection with other strategies, please list the THREE methods for recording and learning vocabulary, which you used most frequently.

153. Did you print off the Thema 4 vocabulary list from the Quizlet programme?

- Yes
- No

154. Please indicate the extent to which you agree or disagree with the statement below. ‘Having access to a translated, printable vocabulary lists for each Rundblick Thema from Quizlet has helped me in my vocabulary learning.’

- Strongly disagree
- Disagree
- Partly agree
- Agree
- Strongly agree

155. Please indicate how much you like particular Quizlet features, by giving marks from 1-5 (i.e. 1 being the least liked) for all features.

	don't like it at all	don't really like it	okay	like it quite a lot	like it very much
‘Flipping’ online flashcards (turning cards to check German against English meaning etc.)					
‘Learn Mode’ (typing in translation from/into German/English)					
‘Test Mode’ (generating translation, matching, true-false tests)					
‘Scatter’ (word					

	don't like it at all	don't really like it	okay	like it quite a lot	like it very much
matching game)					
‘Space Race’ (translating vocabulary against time)					

156. If you have any other feedback or comments relating either to this questionnaire or the study, please use the below. Many thanks for your time!

Appendix 5 – Questions for Participants following Test 1, Test 2 and Test 3

Test 1 – Additional Questions

1. Please indicate below how much time you spent on learning Thema 2 Rundblick vocabulary on average per day or week.

2. What was your main method of WORKING OUT THE MEANING of words encountered during study of Thema 2? (e.g. guessing, using Quizlet for vocabulary list/flashcards, looking up in dictionary)?

3. What was your main method of LEARNING VOCABULARY (e.g. using index cards, word lists, Quizlet)? If you used Quizlet to study Thema 2 vocabulary, please indicate which features you used (e.g. familiarising yourself with the words by using the printed off word list or 'flipping' the online flashcards, 'learning mode', i.e. translating words from/into German/English, 'test mode', i.e. translating, matching, true or false test, 'scatter', i.e. matching game, 'space race', i.e. translating vocabulary).

4. If you would like to leave feedback on this test or the study itself, please use the space below.

Test 2 – Additional Questions

1. During your study of Thema 4, how much time did you spend on learning vocabulary, using the Quizlet programme, per week?

2. If you did not use Quizlet, or only used Quizlet in connection with other strategies, please list the THREE methods for recording and learning vocabulary, which you used most frequently.

3. Did you print off the Thema 4 vocabulary list from the Quizlet programme?

4. Please indicate the extent to which you agree or disagree with the statement below.

5. Please indicate how much you like particular Quizlet features, by giving marks from 1-5 (i.e. 1 being the least liked) for all features. ['flipping' online flashcards (turning cards to check German against English meaning etc.)]

6. Please indicate how much you like particular Quizlet features, by giving marks from 1-5 (i.e. 1 being the least liked) for all features. ['Learn Mode' (typing in translation from/into German/English)]

7. Please indicate how much you like particular Quizlet features, by giving marks from 1-5 (i.e. 1 being the least liked) for all features. [‘Test Mode’ (generating translation, matching, true-false tests)]

8. Please indicate how much you like particular Quizlet features, by giving marks from 1-5 (i.e. 1 being the least liked) for all features. [‘Scatter’ (word matching game)]

9. Please indicate how much you like particular Quizlet features, by giving marks from 1-5 (i.e. 1 being the least liked) for all features. [‘Space Race’ (translating vocabulary against time)]

10. If you have any other feedback or comments relating either to this questionnaire or the study, please use the space below.

Test 3 – Additional Questions

1. Has the way you learn vocabulary changed over the period of this study? Please explain.

2. As you progressed through the course, did the amount of time you spent on learning vocabulary change? Please explain.

3. Did you make use of Quizlet and its features? If you did, please explain. If you didn't, please explain why.

4. If you used Quizlet: Did the way you engaged with Quizlet change over time? If so, how?

5. What would you consider to be an effective way of supporting initial vocabulary learning and ensuring vocabulary retention?

6. If you would like to leave feedback on this test or the study itself, please use the space below.

Appendix 6 – Vocabulary Learning Questionnaire

This is a copy of the online questionnaire on Survey Monkey
http://www.surveymonkey.com/s/SH6KK3M.

Please answer the following questions on your language study background and your strategies for vocabulary learning.
Thank you!

*

1. Please enter your Participant I.D., which you made up yourself and which you have used/are going to use on the vocabulary test. (A word, followed by three digits, e.g. grapefruit123)

PARTICIPANT I.D.:

2. Is English your first language?

3. Have you studied another foreign language before?

☐ Yes ☐ No

4. If 'yes', please give the LANGUAGE and LENGTH OF STUDY
e.g. Turkish - 5 years

5. How long have you been studying German?

6. Do you have regular access to the internet?

7. Please indicate below the frequency with which you use the strategies for learning vocabulary listed below. Please add any other strategies you use but which are not listed and indicate frequency of use.

	always	often	rarely	never
I guess from the context.	○	○	○	○
I use a bilingual (e.g. German-English) dictionary.	○	○	○	○
I write a vocabulary list.	○	○	○	○
I keep a vocabulary notebook.	○	○	○	○
I write words on index cards, with German on one side and the translation on the other.	○	○	○	○

	always	often	rarely	never
I use the OU Flashcard Maker.	○	○	○	○
I group words together under headings and categorise (e.g. 'in town').	○	○	○	○
I record vocabulary on tape/CD/as a sound file, so that I can listen to it.	○	○	○	○
I use diagrams to link words together, e.g. 'food&drink' in a mindmap.	○	○	○	○
I take my vocabulary notes with me, so that I can learn 'on the move'.	○	○	○	○
I use online flashcards (e.g. quizlet, StudyStack) to record vocabulary.	○	○	○	○
(own strategy 1:)	○	○	○	○
(own strategy 2:)	○	○	○	○
(own strategy 3:)	○	○	○	○
(own strategy 4:)	○	○	○	○

Please describe each of your own strategies described. Please don't forget to number your strategies as above.

If you would like to leave feedback on this questionnaire or the study, please use the space below.

Thank you.

Appendix 7 – Invitation to Participate in Study (Phase 1, Control Group)

Dear L193 student,

Invitation to take part in a survey

As part of a project that she is carrying out for her EdD studies at the OU, one of my research students, Susanne Winchester, is investigating language learners' vocabulary learning strategies. At the same time she is also examining how much vocabulary of specific units of L193 are retained.

For this purpose, she has designed a three-part survey. Firstly, we would like to ask you to complete an online questionnaire in which you are asked to give information about your language learning background and the strategies you use for vocabulary learning. Secondly, there will be an online vocabulary test on the vocabulary you learned during Rundblick Thema 2. There are 150 words which need to be translated from English into German. **It is crucial that you do no refer to any course materials/notes or a dictionary while completing the vocabulary test.** Thirdly, you will be asked to keep a log in which we asked you to record how long you spent on specific vocabulary learning activities.

Questionnaires are anonymous and you have the right to opt out of taking part in this survey or to withdraw at any time. The responses will be treated confidentially and used for research purposes only. The results of this research will be treated in line with the Data Protection Act. Data will be kept secure and not released to any third party. No link will be made to your study record.

In order for us to be able to link the two surveys up to the same participant, we would like to ask you to make up your own distinct participant I.D., by choosing a word or name, followed by three digits, e.g. grapefruit123. **Please ensure that you use this I.D., when prompted on the questionnaire and test.**

Please do not hesitate to contact her if you need further clarification or have any concerns. Furthermore, Susanne would also welcome any feedback on the study itself. Her email is sw73@tutor.open.ac.uk. If you prefer to contact me directly, my own email is m.c.fernandez-toro@open.ac.uk

We hope that many of you agree to participate in the survey and would like to thank you for taking time to read this letter of invitation.

With best wishes,

María Fernández-Toro
EdD Supervisor

Appendix 8 – Consent Form (Phase 1, Control Group)

Student Consent Form

Vocabulary Learning Strategies Questionnaire and Vocabulary Test

If you are willing to take part in this research project please tick the box, complete the details below and return the signed form. At any time during the research you are free to withdraw and to request the destruction of any data that have been gathered from you, up to the point at which data are aggregated for analysis.

Your participation or non-participation will not affect your access to tutorial support or the results of your assessments.

The results of any research project involving Open University students constitute personal data under the Data Protection Act. They will be kept secure and not released to any third party. All data will be destroyed once the project is complete.

☐ I am willing to take part in this research, and I give my permission for the data collected to be used in an anonymous form in any written reports, presentations and published papers relating to this study. My written consent will be sought separately before any identifiable data are used in such dissemination.

Signing this form indicates that you understand the purpose of the research, as explained in the covering letter, and agree with the conditions for handling the data you provide.

Name:.....

(please print)

Student PI: .....

Signed: .....

Date: .....

Please return completed form to Susanne Winchester sw73@tutor.open.ac.uk.

Thank you.

Appendix 9 – Invitation to participate in study (Phase 2, Interviews)

Dear L193 student,

Invitation to take part in a telephone interview

You are already a participant on L193 Rundblick vocabulary study. I would now like to investigate your use of the Quizlet vocabulary programme and other vocabulary learning strategies **in a follow-up interview.**

I would like to invite you to take part in a **telephone interview** of approximately 30 minutes' length maximum to discuss how you have engaged with Quizlet in particular and your vocabulary learning strategies in general.

The interviews will be recorded, transcribed and anonymised. You have the right to withdraw from the study and/or interview at any time. The responses will be treated confidentially and used for research purposes only. The results of this research will be treated in line with the Data Protection Act. Data will be kept secure and not released to any third party. No link will be made to your study record.

The follow-up interviews will take place between18-30 June 2012.

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If you are willing to participate in this study, please email s.winchester@open.ac.uk with 'L193 interview' in the email subject field. I will email you to arrange a mutually convenient time for the interview.

Please reply by Monday 8 June 2012.

Please do not hesitate to contact me, if you need further clarification or have any concerns. Furthermore, I would also welcome any feedback on the study itself

I hope that many of you agree to participate in these interviews and would like to thank you for taking time to read this letter of invitation.

With best wishes,

Susanne Winchester

Appendix 10 – Invitation to participate and consent form (Phase 4, Focus Group)

Dear OU Language Student,

Invitation to take part in a survey

Do you use electronic flashcard programmes or other vocabulary learning programmes for your language studies? Have you used these programmes in the past?

As part of a project that she is carrying out for her EdD (Doctorate in Education) studies at the OU, one of my research students, Susanne Winchester, who is also an Associate Lecturer for L193, L130 and L203, is investigating language learners' use of electronic vocabulary learning programmes or flashcards and their experience with these tools.

We would like to invite you to take part in a focus group meeting on Elluminate (a link will be supplied at a later stage) to find out more about your experience of vocabulary learning programmes. This will be a good opportunity for you to discuss and exchange your experience of using electronic vocabulary learning tools with fellow students. In the long-term we hope that insight into students' approach to vocabulary learning in distance learning settings will give practitioners' a better understanding of how students can use technology to enhance vocabulary learning.

Meetings should last about 45 minutes. During the meeting, participants will have the opportunity to discuss their experience with flashcards or other programmes and how effective these are in terms of learning and motivation.

Meetings will be held on the following dates:

Option 1: Monday, 3 June – 20.00

Option 2: Tuesday, 4 June – 11.00

Option 3: Thursday, 6 June – 20.00

Option 4: Sunday, 9 June – 20.00

Option 5: Saturday, 15 June – 11.00

Any data generated will be anonymised and you have the right to opt out of taking part in this survey or to withdraw at any time. The responses will be treated confidentially and used for research purposes only. The results of this research will be treated in line with the Data Protection Act. Data will be kept secure and not released to any third party. No link will be made to your study record.

If you are willing to participate in this study, **please email Susanne Winchester s.winchester@open.ac.uk, with 'Vocabulary Focus Group' in the email subject field** and the following information:

a. the **modules** (module codes, e.g. L192) you are studying

b. **which meeting** you would like to join, by stating up to three options in order of preference

c. your **name** and Elluminate name (if different)

Upon receipt, you will receive further instructions, confirmation of meeting date and time and a consent form. Only those students, who respond to this invitation and return a consent form, will be able to participate. Please reply **by Friday 31 May**.

Please do not hesitate to contact her if you need further clarification or have any concerns. Furthermore, Susanne would also welcome any feedback on the study itself. Her email is s.winchester@open.ac.uk. If you prefer to contact me directly, my own email is m.c.fernandez-toro@open.ac.uk

We hope that many of you agree to participate in this research project and

would like to thank you for taking time to read this letter of invitation.

With best wishes

María Fernández-Toro
EdD Supervisor

Student Consent Form (Focus Group)

Student Engagement with Electronic Vocabulary Learning Programmes to Support Language Learning

If you are willing to take part in this research project, which will take place on Elluminate and which will be recorded, please tick the box, complete the details below and return the signed form. At any time during the research you are free to withdraw and to request the destruction of any data that have been gathered from you, up to the point at which data are aggregated for analysis.

Your participation or non-participation will not affect your access to tutorial support or the results of your assessments.

The results of any research project involving Open University students constitute personal data under the Data Protection Act. They will be kept secure and not released to any third party. Raw data will be kept until all data analyses have been carried out, after which data will be destroyed.

☐ I am willing to take part in this research, and I give my permission for the data collected to be used in an anonymous form in any written reports, presentations and published papers relating to this study. My written consent will be sought separately before any identifiable data are used in such dissemination.

Signing this form indicates that you understand the purpose of the research, as explained in the covering letter, and accept the conditions for handling the data you provide.

Name:.....

(please print)

Student PI: .....

Date: .....

Please return completed form to: s.winchester@open.ac.uk

Appendix 11 – Test scores and percentages for Control Group

CG Test scores for entire vocabulary sets

	Test 1 (432 total)	
m***2	211	48.84%
e***2	160	37.04%
X***3	262	60.65%
k***7	197	45.60%
e***9	294	68.06%
F***2	147	34.03%
d***5	93	21.53%
h***7	283	65.51%
m***7	95	21.99%
G***1	258	59.72%
f***3	234	54.17%
m***0	96	22.22%
e***0	280	64.81%
M***1	232	53.70%
M***3	188	43.52%
s***x	196	45.37%
b***2	320	74.07%
R***7	314	72.69%
n***3	316	73.15%
w***1	251	58.10%
J***7	180	41.67%
B***3	160	37.04%
s***3	178	41.20%
j***7	194	44.91%
N***1	145	33.56%
C***2	283	65.51%
r***9	183	42.36%
W***s	83	19.21%

CG Test scores for 70 common core vocabulary items

TOTAL 210 points	**Test 1**	
m***2	113	53.81%
e***2	93	44.29%
X***3	130	61.90%

k***7	100	47.62%
e***9	145	69.05%
F***2	75	35.71%
d***5	44	20.95%
h***7	145	69.05%
m***7	40	19.05%
G***1	139	66.19%
f***3	106	50.48%
m***0	64	30.48%
e***0	144	68.57%
M***1	125	59.52%
M***3	87	41.43%
s***x	105	50%
b***2	164	78.10%
R***7	163	77.62%
n***3	152	72.38%
w***1	137	65.24%
J***7	105	50%
B***3	79	37.62%
s***3	91	43.33%
j***7	101	48.10%
N***1	176	83.81%
C***2	157	74.76%
r***9	100	47.62%
W***s	53	25.24%

Appendix 12 – Test scores and percentages for Treatment Group

TG (Cohort 1 and 2) Test scores for entire vocabulary sets

	Test 1 (432 total)		Test 2 (447)		TREND T1:T2	Test 3 (432)		TREND T1:T3
M***3	331	76.62%	409	91.50%	↑	306	70.83%	↓
H***5	371	85.88%						
p***4	300	69.44%	368	82.33%	↑	399	92.36%	↑
h***7	119	27.55%	173	38.70%	↑	133	30.79%	↑
m***3	111	25.69%				168	38.89%	↑
b***3	343	79.40%				332	76.85%	↓
G***1	248	57.41%						
W***1	103	23.84%						
j***_6	110	25.46%				144	33.33%	↑
b***1	86	19.91%	173	38.70%	↑	188	43.52%	↑
s***1	179	41.44%						
e***3	265	61.34%	288	64.43%	↑	342	79.17%	↑
P***4	137	31.71%				152	35.19%	↑
B***9	367	84.96%	354	79.19%	↓	392	90.74%	↑
m***8	207	47.92%				42	9.72%	↓
D***1	314	72.69%	376	84.12%	↑	398	92.13%	↑
C***3	381	88.19%	392	87.70%	↓	410	94.91%	↑
f***9	350	81.02%	391	87.47%	↑	367	84.96%	↑

S***8	249	57.64%	244	54.59%	↓	265	61.34%	↑
A***x	336	77.78%	314	70.25%	↓			
T***3	361	83.56%				362	83.80%	↑
F***5	234	54.17%				285	66%	↑
k***3	46	10.65%						
A***4	332	76.85%						
N***1	215	49.77%				165	38.19%	↓
c***i	331	76.62%				315	72.92%	↓
d***h	167	38.66%	328	73.38%	↑	143	33.10%	↓
k***23	279	64.58%						
M***8	168	38.89%						
D***6	266	61.57%						
m***9	146	33.80%	158	35.35%	↑	180	41.66%	↑
F***6	44	10.19%						
R***1	341	78.94%						
a***4	97	22.45%				60	13.89%	↓
p***6	239	55.32%				265	61.34%	↑
m***7	135	31.25%						
s***3	339	78.47%						
s***n	181	41.90%						
l***1	9	2.08%						
l***9	159	36.81%						
b***3	185	42.82%				251	58.10%	↑
m***8	320	74.10%						
A***1	176	40.74%						

w***3	181	41.90%	214	47.87%	↑			
S***0	290	67.13%	263	58.84%	↓	139	32.18%	↓
m***23	225	52.08%						
S***t	130	30.09%						
t***g	37	8.56%						
b***5	89	20.60%						
a***d	159	36.81%						
w***3	176	40.74%				204	47.22%	↑
N***F	395	91.44%	362	80.98%	↓	416	96.30%	↑
M***3	62	14.35%						
A***5	151	34.95%						
A***8	140	32.40%	222	49.66%	↑			
U***X	222	51.39%						
Y***6	250	57.87%						
B***80	50	11.57%	94	21.03%	↑	98	22.69%	↑
B***90	409	94.68%						
R***4	415	96.06%	333	74.5	↓	282	65.28%	↓
P***7	42	9.72%						
B***4	82	18.98%						
E***60	303	70.14%						
X***6	213	49.31%						
B***81	197	45.60%						
B***08	178	41.20%						
P***3	327	75.69%						
A***58	75	17.36%	74	16.55%	↓			

B***93	105	24.31%						
B***06	123	28.47%						
B***71	90	20.83%	148	33.11%	↑			
re***4	182	42.13%						
M***5X	387	89.58%						
F***3X	191	44.21%	190	42.51%	↓			
K***5	154	35.65%	240	53.69%	↑			
Y***1	408	94.44%	349	78.08%	↓			
U ***7	165	38.19%						
M***36	88	20.37%	167	37.36%	↑	135	31.25%	↑
B***06	158	36.57%						
T9***9	327	75.69%	212	47.43%	↓	118	27.31%	↓
Y***90	329	76.16%						
B***5X	280	64.81%						
B***11	270	62.50%	350	78.30%	↑			
A1***9	212	49.07%						
B8***1	149	34.49%	156	34.90%				
X***4	76	17.59%						
m***7	176	40.74%	157	35.12%	↓	159	36.81%	↓
R***7X	290	67.13%	274	61.30%	↓	290	67.13%	↓
Y9***8	219	50.69%	214	47.87%	↓	263	60.88%	↑
M5***5	121	28.01%						
B6***8	364	84.26%	360	80.54%	↓	336	77.78%	↓
F0***3	91	21.06%						
M4***7	216	50%	240	53.69%	↑			

a***5	172	39.81%						
A8***1	14	3.24%						

TG (Cohort 1 and 2) Test scores for 70 common core vocabulary items (only includes participants who completed at least two tests)

TOTAL 210 points	**Test 1**		**Test 2**		**TREND T1:T2**	**Test 3**		**TREND T1:T3**
M***3	157	74.76%	152	72.38%	↓	199	94.76%	↑
H***5								
p***4	161	76.67%	181	86.19%	↑	187	89.05%	↑
h***7	66	31.43%	79	37.62%	↑	91	43.33%	↑
m***3	65	30.95%	86	40.95%	↑			
b***3	177	84.29%	172	81.90%	↓			
G***1								
W***1								
j***_6	62	29.52%	82	39.05%	↑			
b***1	48	22.86%	94	44.76%	↑	87	41.43%	↑
s***1								
e***3	124	59.05%	174	82.86%	↑	144	68.57%	↑
P***4	74	35.24%	95	45.24%	↑			
B***9	188	89.52%	173	82.38%	↓	180	85.71%	↓
m***8	102	48.57%	17	8.10%	↓			
D***1	164	78.10%	183	87.14%	↑	186	88.57%	↑
C***3	189	90%	199	94.76%	↑	189	90%	↓
f***9	172	81.90%	190	90.48%	↑	197	93.81%	↑
S***8	132	62.86%	143	68.10%	↑	133	63.33%	↑
A***x								

T***3	172	81.90%	175	83.33%	↑	154	73.33%	↓
F***5	127	60.48%	127	60.48%				
k***3								
A***4								
N***1	108	51.43%	83	39.52%	↓			
c***i	155	73.81%	160	76.19%	↑			
d***h	83	39.52%	76	36.19%	↓	163	77.62%	↑
k***23								
M***8								
D***6								
m***9	74	35.24%	93	44.29%	↑	84	40	↑
F***6								
R***1								
a***4	61	29.05%	40	19.05%	↓			
p***6	127	60.48%	131	62.38%	↑			
m***7								
s***3								
s***n								
l***1								
l***9								
b***3	98	46.67%	128	61.43%	↑			
m***8								
A***1								
w***3								
S***0	141	67.14%	63	30%	↓	120	57.14%	↓
m***23								

S***t								
t***g								
b***5								
a***d								
w***3	92	43.81%	106	50.48%	↑			
N***F	191	90.96%	195	92.86%	↑	176	83.81%	↓
M***3	44	20.95%						
A***5	78	37.14%						
A***8	79	37.62%	114	54.29%	↑			
U***X	120	57.14%						
Y***6	144	68.57%						
B***80	35	16.67%	56	26.67%	↑	59	28.10%	↑
B***90	202	96.19%						
R***4	202	96.19%	152	72.38%	↓	155	73.81%	↓
P***7	22	10.48%						
B***4	42	20%						
E***60	144	68.57%						
X***6	120	57.14%						
B***81	101	48.10%						
B***08	106	50.48%						
P***3	166	79.05%						
A***58	48	22.86%	40	19.05%	↓			
B***93	53	25.24%						
B***06	70	33.33%						
B***71	47	22.38%	71	33.81%	↑			
re***4	104	49.52%						

M***5X	201	95.71%						
F***3X	108	51.43%	90	42.86%	↓			
K***5	76	36.19%	118	56.19%	↑			
Y***1	206	98.10%	142	67.62%	↓			
U ***7	91	43.33%						
M***36	46	21.90%	84	40%	↑	72	34.29%	↑
B***06	86	40.95%						
T9***9	162	77.14%	106	50.48%	↓	66	31.43%	↓
Y***90	157	74.76%						
B***5X	150	71.43%						
B***11	139	66.19%	173	82.38%	↑			
A1***9	116	55.24%						
B8***1	72	34.29%	72	34.29%				
X***4	47	22.38%						
m***7	94	44.76%	67	31.90%	↓	86	40.95%	↓
R***7X	155	73.81%	153	72.86%	↓	156	74.29%	↑
Y9***8	109	51.90%	115	54.76%	↑	132	62.86%	↑
M5***5	72	34.29%						
B6***8	178	84.76%	168	80%	↓	168	80%	↓
F0***3	59	28.10%						
M4***7	116	55.24%	126	60%	↑			
a***5	89	42.38%						
A8***1	14	6.67%						

Appendix 13 – Interview (Interviewee 1) transcription

Interview Questions:

1. Can you describe a typical vocabulary learning session with Quizlet?

2. What do you perceive to be the benefits of using Quizlet over other tools and strategies?

3. What are its disadvantages in your opinion?

4. Do you think Quizlet has made an impact on the way you approach vocabulary learning?

5. Does the way you use Q change according to whether you are at the beginning of a Thema or at the end?

6. Would you use Q for recording your own sets?

1. What does a typical learning session with Quizlet look like?

What I usually do is I print off first the list you put up cos then I can have it round the house with me. Then what I usually do is, sort of everyday, is go onto the site and either look at the… … I like the… what do you call the cards that you got on the double sided… [the flipping] … and the speller is great that you type what you hear. But I use also if I am tired and it's like an evening, if I only got, say, an hour in the evening, I use the Scatter… I find that really, really good. And then, I probably give it, sort of, when I'm doing the course, by the end of the course, the test you have to see how I'm getting on. Because I am finding the vocabulary the hardest part to learn.

…. In fact, you have done Quizlet as an added extra to the L193, it doesn't come with it. And I actually thought, I don't think, I don't think the course would be as good by far without Quizlet. I think it needs to be an integral part of the language courses. Nobody will … I mean on the list, it's lots of terms like… it's 299 words. As a student you would never have picked that up. Vocabulary without Quizlet in the book I don't think is good enough. Because you only get it in little tiny boxes and there are only like half a dozen words. You'd never be able to pick up the amount of vocabulary in the time the course is running. Because the course is running quite quickly. And I think without Quizlet, I think it needs to be certainly an integral part of the language courses of the OU, definitely.

5. ….You said it depends on where you are, how you use Quizlet. So for example, if you are at the beginning of a Thema you will use Quizlet in a different way as opposed to when you are at the end of a Thema. So you use the test to self-test you?)

Yes, I use the test at the end. At the beginning, I mean I always look, every day, for when you put the new Quizlet section on for each Thema and as soon as that's on, as soon as it comes on, the first thing I do is print the lists off. Because then, as I am around the house, that I'm doing something round the house, I can have the lists next to me and be looking at the lists, and trying to learn vocabulary that way.

2. **What do you perceive to be the advantage of Quizlet over other tools? ….So, are there benefits of using Quizlet over other tools or?)**

I think the thing with Quizlet is that it's always there that you can go to. I mean when I am doing for example, I'll walk the dogs and I practise vocabulary when I am walking the dogs but the great thing with Quizlet is… it's like… you know it's there, you can think 'right, I've got half an hour, get on the computer and I can do scatter or I can do the speller check and it feels as though it is a good foundation. Do you know what I mean? an anchor because I think without it it would be so easy to do not as much in the vocabulary. Because it's too much to think 'oh I've got to get the dictionary out […] but it is so easy to use, that's the great thing about it... it won't click and it comes up again **(?)** and it's fun to use. That's the other thing about it It feels, it doesn't feel too heavy. If you've got to get a dictionary out and you've got all that looking through. It think it's so much, I think it's great to flick down the list or to have a test, to have….??? I haven't done very well on and I'll go back and it's all there in one resource. I think it's fantastic.

3. **So what do you think then are disadvantages of Quizlet?** I don't think there are any. It's the best thing ever. I really do. I can't believe that the course doesn't come with it. Because I actually withdrew from the course because I was finding it too much and I didn't realise that didn't take the computer section off. And I actually had to get back on to the university because I missed Quizlet so much. Because I decided I'd do the course in my own time because it was running too quickly for me. And I actually had to get back on the Open University and come back as a student because I said 'I can't do the vocabulary without Quizlet' (…). It is that good … it is fantastic and so comprehensive and I'm still doing the course but I'll be quite honest I couldn't do it without having all the vocabulary in the list. Having it there for you, it's

brilliant. **….**I really mean that. I think because I said to my husband, I don't know how they can run a course without something like this. I would never have picked up 299 words of vocabulary out of the Thema, if you were on your own as a student. You just wouldn't do it. **…..**. And also you got the audio section, where it actually pronounces the word for you. You can look at it. I don't know how they to pronounce (??) and it comes up and you can keep doing it as many times as you like until you got it. I think it's fantastic**.**

4. So, do you think Quizlet has made an impact on the way you approach vocab learning altogether? So, if you learned another language, would you tackle it in a different way now?

If I was looking at the OU and it didn't have Quizlet on, I'm quite honest I wouldn't do the course. There is no way I could find the amount of vocabulary you need to do a language.

6. **And would you use Quizlet to record your own sets.** Oh, yes, yeah. **Is that something you would do? Do you think you would…** Oh yes, yeah. Definitely. I think it's a wonderful resource. It's great. **…..**I put them on my favourites. I'm not very good on computers. My friend showed me how to put it on my favourites bar. So I've got all Quizlet sections from *Thema* 1 down to where we are now on the favourites one and I can just pick them and keep doing them that way. **(So you go back to some you have done before?)** Oh, yes. I mean yesterday I went back to *Thema* 1. To make sure that I was still ?? because it is easy to be ?? because we are getting onto the harder things that you forget some of the simpler things. So I went back and did a refresher on that yesterday.

How do you use Quizlet to learn initially and how do you use it to maintain….. And then, do you use particular functions, I mean do you use the testing function or …) What I did yesterday, I used the test and it's always the first bit on the test which is my weakness where you just have the English word and you have to find the German. Multiple choice and?? I can remember but I can never remember the first bit where I have to pull the word out of the bag, if you like, from my head. And that is the thing I have to keep going over and over and over.

You said that you are not very good with computers and that you had a friend helping you. … if we talk about ease of use of Quizlet - do you find that quite easy to use?

I found I could use it myself, once I got on to the site, worked out how to use it, I could as someone who had really struggled with computers, I could use it. But I was having to sort of pull it up all the time, and my friend said to me 'look I'll put it on the favourites for you' and you can just click and you get there straight away. That was a great help. But I mean most people are much more …computer-literate than I am. That is also with the course that I have struggled over because I can't study on Elluminate, so obviously I can't do the oral part... It is – that's the great part about it: you can just go on it for half an hour: 'Oh, I use Scatter or Space Race' and it makes you feel better actually. **…..** I think if you had to do it all yourself, you become very demotivated. It would just be too tiring. You know, you've got the rest of your life going on with family. You become very, I think, you become very demotivated and you wouldn't do as much vocabulary as you do on Quizlet, 'cos I do vocabulary every day on it. Which I wouldn't have done, if I sort of thought: 'now I've got to look everything up' - you get tired. Where with Quizlet, if you are fresh in the morning, you can do more of the Spellers and the Learn part, if you sort of just got half-an-hour at night, you're tired, you've seen to all the family and for one thing or another you think 'oh, I can go on Scatter for half-an-hour'. You are still learning the vocabulary which is an important thing. **….**